

STRATEGIES FOR DEVELOPING INDIVIDUAL EDUCATION PROGRAMS FOR PUBLIC SCHOOL
MUSIC STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER AND DYSLEXIA

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This research explores the need for curriculum modifications, accommodations, and remediation techniques for beginner band students with specific learning disorders (SLDs) under the umbrella of Individual Education Programs (IEPs) or 504 plans for attention-deficit/hyperactivity disorder (ADHD) and/or dyslexia. ADHD and dyslexia are the most common of the neurodevelopmental disorders, often affecting a student's ability to stay focused and attentive; remain quiet and well behaved; comprehend written, visual and/or oral instruction; organize thoughts and materials; exhibit good time management; execute fine and gross motor skills; retain and recall information; decode symbols; process information quickly and correctly; maintain healthy, interpersonal relationships; and overcome anxiety. In order to provide inclusive instruction, music educators should understand how to identify these (often comorbid) conditions and the musical challenges these students might encounter, including time/pulse, notation, rhythm, posture, fingerings, and sight-reading.

A guide for instrumental directors and private instrumental teachers, "How to Accommodate or Modify Musical Instruction for a Student with ADHD and/or Dyslexia," is included in this dissertation to provide useful information, multisensory techniques, and suggestions to help students with these learning disabilities achieve better success in the music classroom.

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LIST OF ABBREVIATIONS

ABRSM – Associated Board of the Royal Schools of Music

ADA – Americans with Disability Act of 1990

ADHD – Attention-Deficit/Hyperactivity Disorder

ADHD/Dyslexia – ADHD and/or Dyslexia

ARD – Admission, Review, and Dismissal

BPES – Blepharophimosis-Ptoxis-Epicanthus Inversus Syndrome

BPM – Beats Per Minute

CDC – Centers for Disease Control and Prevention

DSM-5 – Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

FERPA – Family Educational Rights and Privacy Act of 1974

GT – Gifted and Talented

IDA – International Dyslexia Association

IDEA – Individuals with Disabilities Education Act of 2004

IEP – Individual Education Program

LEAs – Local Educational Agencies

LSU – Louisiana State University

NCLB – No Child Left Behind Act of 2001

NIMH – National Institute of Mental Health

Rehab Act – Rehabilitation Act of 1973

SBOE – State Board of Education

SLD – Specific Learning Disorder

SSI – Student Success Initiative

STAAR – State of Texas Assessments of Academic Readiness

TAC – Texas Administration Code

TEA – Texas Education Agency

TEC – Texas Education Code

TEKS – Texas Essential Knowledge & Skills

TMEA – Texas Music Educators Association

UNT – University of North Texas

VCU – Virginia Commonwealth University

CHAPTER 1

INTRODUCTION

In the Texas public school system, teaching students with attention-deficit/hyperactivity disorder (ADHD) and dyslexia has been a neglected portion of the music curriculum. Because most of the research into the two conditions is focused upon general education and how students can better improve their grades and learning in standard subjects, music education has been an area in which research and application has been generally neglected. The objective of this document is to offer strategies for accommodations and/or modifications to the State Board of Education's (SBOE's) Texas Essential Knowledge & Skills (TEKS) core curriculum, for possible implementation on behalf of students with ADHD and dyslexia who have IEPs or 504 plans; and to create a resource for music educators to use for identification and remediation assistance when teaching students who have ADHD and/or dyslexia.

ADHD and dyslexia are both neurodevelopmental brain disorders that affect how a person learns, focuses, memorizes, socializes, and processes data. ADHD/dyslexia impact a student's learning because the brain has difficulties in decoding, multitasking, motivation, and short-term memory.¹ Both conditions can have a debilitating effect on the ability to learn musical notation, instrument mechanics, and to perform in public. A high co-occurrence exists between the two conditions, making it important to discuss them concurrently. People who have dyslexia possess the comorbid condition of ADHD an estimated 15-40% of the time.

¹ Murray J. Dyck and Jan P. Piek, "Developmental Delays in Children with ADHD," *Journal of Attention Disorders* 18, no. 5 (2014): 466-467; Guinevere F. Eden and Chandan J. Vaidya, "ADHD and Developmental Dyslexia: Two Pathways Leading to Impaired Learning," *Annals of the New York Academy of Sciences* 1145 (2008): 316.

Additionally, 25-40% of people with an ADHD diagnosis also have dyslexia.² Left undiagnosed and unremediated, students with ADHD/dyslexia can spiral down a path of depression, anxiety, social ostracism, and failure.³ However, early identification and intervention through remediation of the musical traits these students possess can profoundly impact a student's growth in music. This can lead to the discovery that these students both succeed and excel on a musical instrument.⁴

According to the International Dyslexia Association (IDA) and the Centers for Disease Control and Prevention (CDC), 15-20% of the population suffers with dyslexia and 5%-11% with ADHD.⁵ In an incoming class of 100 students, 20 will likely have dyslexia, 12 will have ADHD, and 5 will have both. It is therefore a statistically likely that classroom music teachers and private lesson instructors will encounter students with ADHD/dyslexia each year. Having a strong knowledge base of the symptoms involved with these conditions will enable music educators to teach 100% of their class or studio.

This paper will cover the scientific information about ADHD/dyslexia, current legal information as to the rights and responsibilities of music educators, the many musical strengths and weaknesses of both conditions, and a thorough examination and evaluation of the TEKS curriculum for 6th-grade music students. By creating a resource that caters to the band director

² Eden, "ADHD and Developmental Dyslexia," 317.

³ Jason M. Nelson and Noel Gregg, "Depression and Anxiety Among Transitioning Adolescents and College Students with ADHD, Dyslexia, or Comorbid ADHD/Dyslexia," *Journal of Attention Disorders* 16 (October 2010): 249-250.

⁴ Sheila Oglethorpe, *Instrumental Music for Dyslexics: A Teaching Handbook*. 2nd ed. (London: Whurr Publishers, 2002), 8.

⁵ Louisa C. Moats and Karen E. Dakin, "Dyslexia Basics," The International Dyslexia Association, accessed April 10, 2014, <https://dyslexiaida.org/dyslexia-basics/>; Center for Disease Control and Prevention, "Attention-Deficit/Hyperactivity Disorder (ADHD): Data and Statistics," last modified May 4, 2016, accessed September 14, 2016, <http://www.cdc.gov/ncbddd/adhd/data.html>.

and private teacher, this paper will attempt to help students with these conditions thrive in the music classroom.

As a professional musician with comorbid ADHD and dyslexia, I am personally connected to this project. I have spent over 20 years of my life dedicated to perfecting my ability to play the horn and 15 years to passing on that knowledge to others. Research has opened my eyes to the many manifestations, limitations, and benefits my conditions have provided me over the years. Additionally, being able to bring about awareness to other music educators and assistance to future musicians like me is important to me as a teacher. If this document can aid even one band director or one private instructor help and guide a talented student who struggles with ADHD/dyslexia, then I have succeeded as a music educator.

CHAPTER 2

EXPLORING ADHD, DYSLEXIA, AND COMORBIDITY

2.1 Introduction

Both ADHD and dyslexia are neurodevelopmental disorders. Neurodevelopmental disorders are “a group of conditions with onset in the developmental period. The disorders typically manifest early in development, often before the child enters grade school, and are characterized by developmental deficits that produce impairments of personal, social, academic or occupational functioning.”⁶ Other neurodevelopmental disorders include autism spectrum disorder; intellectual development disorder; coordination disorders, such as language disorder, speech sound disorder, childhood-onset fluency disorder (stuttering); social communication disorder; and motor coordination disorders (e.g., stereotypic movement, tic disorders, or developmental coordination disorder).⁷

2.2 Attention-Deficit/Hyperactivity Disorder

ADHD is one of the most common neurodevelopmental disorders, or a set of conditions that appears typically in early childhood. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) defines ADHD as “a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.”⁸ Inattention inhibits the ability to organize thoughts and materials, stay focused on the task at hand, and listen attentively. Hyperactivity-impulsivity involves the inability to be still and quiet, and the inability

⁶ American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition: DSM-5*, (Washington: American Psychiatric Association, 2013), 31.

⁷ *Ibid.*, 31-32.

⁸ *Ibid.*, 32.

to wait, which can intrude into other people's lives and activities. The symptoms are excessive for the person's age and developmental level and can impair academic, occupational, and social functioning well into adulthood.⁹

The National Institute of Mental Health (NIMH) divides ADHD into three subtypes defining the characteristics of each:

1. **Predominantly hyperactive-impulsive:** Most symptoms (six or more) are in the hyperactivity-impulsivity categories. Fewer than six symptoms of inattention are present, although inattention may still be present to some degree.
2. **Predominantly inattentive:** The majority of symptoms (six or more) are in the inattention category and fewer than six symptoms of hyperactivity-impulsivity are present, although hyperactivity-impulsivity may still be present to some degree. Children with this subtype are less likely to act out or have difficulties getting along with other children. They may sit quietly, but they are not paying attention to what they are doing. Therefore, the child may be overlooked, and parents and teachers may not notice that he or she has ADHD.
3. **Combined hyperactive-impulsive and inattentive:** Six or more symptoms of inattention and six or more symptoms of hyperactivity-impulsivity are present.¹⁰

New ADHD research, including expanded diagnosis guidelines in the DSM-5, no longer considers ADHD as purely a behavioral disorder, but a cognitive one as well. Behavioral deficits, however, can be a major symptom for children and adults with ADHD. Oppositional defiant disorder (ODD) often accompanies ADHD and is characterized by a strong defiance, hostility, and opposition to conform to the demands of authority, complete with impulsivity issues, a problem remembering instructions, focusing and sustaining mentally draining activities, and a lack of willingness to conform and complete tasks.¹¹ Psychologists are now beginning to

⁹ Ibid.

¹⁰ National Institute of Mental Health, "Attention Deficit Hyperactivity Disorder," United States Department of Health and Human Resources, last modified March 2016, accessed September 14, 2016, <http://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml>.

¹¹ American Psychiatric Association, *DSM-5*, 63.

describe ADHD as a cognitive disorder—a developmental impairment of executive functions, which, much like the chief executive officer of a company, includes the ability to analyze, organize, schedule, plan, decide, and execute. Four circuits in the brain relate to executive functioning: 1. working memory, 2. self regulation of affect/motivation/arousal, 3. internalization of speech, and 4. reconstitution. All of these executive functions must be working concurrently and correctly for a person to exhibit proper motor control, fluency, and syntax. These broader areas impact the ability to stay on task, execute goals, execute complex motor sequences, be sensitive to response feedback, re-engage in tasks following a disruption, and control behavior through the use of a guiding inner voice.¹²

The working memory component of executive function gives us our sense of time—the “when.” It allows us to hold events in our minds, manipulate or act upon the events, gives us foresight and hindsight, and allows us to organize thoughts in sequential time. When presenting a story, a child with ADHD has more difficulty presenting coherent, organized information in a linear, but creative, way. The part of the brain involved in this function stretches from the prefrontal area back to the cerebellum. It is involved in the timeliness and sequence of our actions. When this part of the brain malfunctions, it can explain why people with ADHD often have problems with time management skills.

The self-regulation of affect/motivation/arousal circuit in the brain helps explain the “why,” or reason that we feel a certain emotion towards an event or action. This circuit originates from the frontal lobe, goes through the central part of the brain, or anterior

¹² Russell A. Barkley, “Behavioral Inhibition, Sustained Attention, and Executive Functions: Constructing a Unifying Theory of ADHD,” *Psychological Bulletin* 121, no. 1 (1997): 72-75.

cingulate, to the amygdala. This circuit is the final decision-maker in our plans; it helps us choose among several different options based upon their motivational and emotional features.

Internalization of speech governs our moral compass, helps us create and adhere to rule-governed behavior, to reflect, self-question, and problem solve. This “what” circuit, or internalization of speech, contributes to self-restraint and self-guidance, regardless of external or reward-based reinforcement. Children with ADHD are less likely to resist “forbidden temptations” than their neurotypical peers.¹³ They may also have difficulty in reconciling that they should follow the rules when they receive “rewards” (attention, albeit negative) for violating the rules.¹⁴ Delayed rewards or gratification may cause a child with ADHD to make poor choices. It is imperative to consistently praise good behavior so that the child with ADHD will both understand what good behavior is, and will continue to want to please those in authority positions. An incorrect internalization of speech can lead to poor self-regulation and motivation, disruptive and aggressive outbursts in the classroom, and diminished social competency.¹⁵ The prefrontal lobe is responsible for this particular brain circuit, and damages or injuries to this area have notably contributed to deficiencies in internalized speech.

Reconstitution is the analysis and synthesis of behavior, verbal and behavioral fluency, and goal-directed behavioral creativity. It is the “unique capacity of humans to create extraordinarily complex and novel behavioral structures in the service of attaining future goals.”¹⁶ It is the “who” circuit where self-awareness takes place. In combination with working memory, reconstitution gives humans the power to create possible outcome scenarios in our

¹³ Ibid., 81.

¹⁴ Ibid., 82.

¹⁵ Ibid.

¹⁶ Ibid., 72-73.

minds and to weigh how the choice of a particular behavior could influence the future in a positive way. People with ADHD may have greater difficulty with situations and interpersonal relationships in which reconstitution is crucial. The prefrontal cortex is responsible for reconstitution.¹⁷

The term ADHD can be thought of as an umbrella term that encompasses a range of executive functioning deficits. The strength of the following cognitive abilities can quantify a person's executive functioning skills: self-awareness, inhibition or emotional self-regulation, non-verbal and verbal working memory, self-motivation, and planning and problem solving. A problem with any of these executive functions can account for the appearance of inattentiveness, or inattention—the number one diagnostic criteria for ADHD in the DSM-5 (the number two criteria being hyperactivity and impulsivity).¹⁸ Each of these executive functions develops over time. People with ADHD are generally 30-40% behind their peers in their ability to transition from one executive function to another, making them appear to be about three years behind their peers socially, behaviorally, and emotionally.¹⁹

2.3 Dyslexia or Specific Learning Disorder

A concise definition of dyslexia is nearly unattainable, as the term “dyslexia” has both a broad and specific definition. When asked about dyslexia, a typical response will be “that’s where someone gets letters or words out of order.”²⁰ However, many cases of dyslexia do not

¹⁷ Ibid., 82.

¹⁸ American Psychiatric Association, *DSM-5*, 59-60.

¹⁹ National Institute of Mental Health, “Attention Deficit Hyperactivity Disorder”; Itai Berger, et al., “Maturational Delay in ADHD: Evidence from CPT,” *Frontier in Human Neuroscience* 7 (Oct 2013): 698.

²⁰ Vellutino et al., “Specific Reading Disability (Dyslexia): What Have We Learned in the Past Four Decades?” *Journal of Child Psychology and Psychiatry* 45, no. 1 (2004), 8.

present this symptom.²¹ Since dyslexia is a left hemisphere posterior brain development deficiency, most people with dyslexia have a wide range of symptoms unrelated to the activity of reading words on paper.²² The DSM-5 defines dyslexia as “an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities.”²³ The DSM-5 groups the term dyslexia under the broader term “specific learning disorder (SLD),” but acknowledges that “specific types of reading deficits are described internationally in various ways as *dyslexia*...”²⁴ The broader term SLD is defined as:

a neurodevelopmental disorder with a biological origin that is the basis for abnormalities at a cognitive level that are associated with the behavioral signs of the disorder. The biological origin includes an interaction of genetic, epigenetic, and environmental factors, which affect the brain’s ability to perceive or process verbal or non-verbal information efficiently and accurately.²⁵

The Texas Education Agency (TEA) defines dyslexia and its related disorders in the dyslexia handbook under the Texas Education Code (TEC) §38.003 in the following manner:

(1) Dyslexia means a disorder of constitutional origin manifested by a difficulty in learning to read, write, or spell, despite conventional instruction, adequate intelligence, and sociocultural opportunity.

(2) Related disorders include disorders similar to or related to dyslexia such as developmental auditory imperception, dysphasia, specific developmental dyslexia, developmental dysgraphia, and developmental spelling disability.²⁶

²¹ Ibid., 9.

²² Sally E. Shaywitz and Bennett A. Shaywitz, “Dyslexia (Specific Reading Disability),” *Biological Psychiatry* 57, no. 11 (2005): 1307.

²³ American Psychiatric Association, *DSM-5*, 67.

²⁴ Ibid., 809.

²⁵ Ibid., 68.

²⁶ Texas Education Agency, *The Dyslexia Handbook: Procedures Concerning Dyslexia and Related Disorders*, rev. ed., updated, (Austin: Texas Education Agency, 2010), 8.

Dyslexia is an inherited, genetic condition. It might be helpful to know if an immediate family member has dyslexia, in which case it would be a good idea to watch out for similar symptoms and learning difficulties in siblings in the music classroom. Sally Shaywitz explains,

Dyslexia is both familial and heritable. Family history is one of the most important risk factors, with 23 percent to as much as 65 percent of children who have a parent with dyslexia reported to have the disorder. A rate among siblings of affected persons of approximately 40 percent and among parents ranging from 27 to 49 percent provides opportunities for early identification of affected siblings and often for delayed but helpful identification of affected adults.²⁷

American society tends to conflate the narrow, antiquated definition of dyslexia as “letters or words out of order,” with the broader definition referencing a variety of learning disabilities, complicating our understanding of the term “dyslexia.” Thus, the term has become a confusing colloquial expression. Liz Dunoon attempts to clarify this confusion by defining dyslexia as an “umbrella term” encompassing eight separate subtypes.²⁸ Her umbrella term for dyslexia fits within the DSM-5’s definition of SLDs. According to Dunoon, individuals may possess one or a combination of these symptoms for a full clinical diagnosis of dyslexia: 1. dyslexia (trouble with reading and spelling despite intelligence), 2. dysphasia or apraxia (difficulty with pronunciation or the translation of thoughts into words), 3. dysgraphia (difficulty with handwriting), 4. dyspraxia (difficulty with balance, small and large body movements, muscle tone, and poor posture), 5. auditory dyslexia or auditory processing problems (difficulty with listening, understanding spoken instruction, self-expression, rhyme, and rhythm), 6. executive dysfunction (difficulty with ongoing thoughts, time, planning, sequencing, attention, memory, recall, and response), 7. visual dyslexia or visual processing problems (difficulty with

²⁷ Shaywitz, “Dyslexia (Specific Reading Disability),” 1301.

²⁸ Liz Dunoon, *Helping Children with Dyslexia: 21 Super Strategies to Ensure Your Child’s Success at School*, 3rd ed. (Park Orchards, Victoria, Australia: Transformation Trust, 2010), 53.

spatial relations, orientation, and direction), and 8. dyscalculia (difficulty with numbers, mathematical symbols, terms and concepts).²⁹ For the music educator, it is important to treat all diagnosed students with dyslexia with the assumption that they may show symptoms of one to all of the traits under the dyslexia umbrella.

SLD severity levels range from mild to moderate to severe. Mild symptoms involve some difficulties in one or two academic categories, yet the student can compensate and function well in the classroom, especially when offered accommodations and supportive services. In moderate cases, the student has obvious learning difficulties in one or more academic areas and must receive some intervals of intense, specialized training in order to become proficient at certain tasks. A person with moderate dyslexia will most likely need some accommodations or supportive services at school, in the workplace, and at home, in order to learn to correctly and efficiently complete activities. In severe cases, the student has extreme difficulty learning skills needed for several academic courses. The severely affected student must receive continuous, consistent, intense, individualized training throughout most of the school years. Even with specialized accommodations or services (at school, home, or in the workplace), the individual may not be able to complete tasks appropriately.³⁰

While dyslexia is a hindrance to the student in the learning environment, it also has wonderful benefits to thinking and musical development. Because of the plasticity of the brain, people with dyslexia are able to compensate for left-brain deficiencies by heavily relying upon other parts of the brain in order to read and process information: the brain rewires itself when learning music. “Gab. *et al.* (2005) showed that participants with music training seemed to have

²⁹ Ibid.

³⁰ American Psychiatric Association, *DSM-5*, 68.

an enhanced ability to process rapid spectro-temporal acoustic cues and use different neural networks for the processing of these cues.”³¹ While this process takes time, making learning and processing less automatic, a person with dyslexia is able to commit and recall vast amounts of information from long-term memory and therefore, make more diverse and creative connections than perhaps the neurotypical individual.³² “The brains of dyslexics aren’t defective; they’re simply different. These wiring differences often lead to special strengths in processing certain kinds of information, and the strengths typically more than make up for the better-known dyslexic challenges.”³³ Differences in dyslexic processing can predispose individuals to some important advantages and abilities:

- Three-dimensional spatial reasoning and mechanical ability
- The ability to perceive relationships like analogies, metaphors, paradoxes, similarities, differences, implications, gaps, and imbalances
- The ability to remember important personal experiences and to understand abstract information in terms of specific examples
- The ability to perceive and take advantage of subtle patterns in complex and constantly shifting systems or data sets³⁴

In the field of music, these advantages can translate to excellent melody and pitch recognition, expressive musical choices, pattern recognition, contextual recognition (the ability to equate a current musical example to one from a previous piece or the ability to form an analogy between a musical concept and a non-musical personal experience), excellent memorization, and the ability to problem-solve. Some famous, successful people with dyslexia include Albert Einstein, Alexander Graham Bell, Winston Churchill, Leonardo da Vinci, Henry

³¹ Marie Forgeard, et al., “The Relation Between Music and Phonological Processing in Normal-Reading Children and Children with Dyslexia,” *Music Perception* 25, no. 4 (2008): 384.

³² Brock L. Eide and Fernet F. Eide, “Chapter 16: the Advantages of N-Strengths,” *The Dyslexic Advantage: Unlocking the Hidden Potential of the Dyslexic Brain*, (New York: Hudson Street Press, 2011), 115-125.

³³ Eide, *The Dyslexic Advantage*: xvii.

³⁴ *Ibid.*, 5.

Ford, Walt Disney, Nelson Rockefeller, Agatha Christie, Woodrow Wilson, W.B. Yeats, and Charles Schwab, among others.³⁵

In scientific research, the term “dyslexia” may also be interchanged with a number of other terms: learning disability, reading disability, specific reading disability, intellectual disability, specific language impairment, developmental disorder, speech and language impairment, and so forth. For the purpose of this discussion, the term dyslexia will be used as the umbrella term when speaking about problems in music related studies. As both Liz Dunoon and the TEA speak to the many related symptoms that a student with dyslexia may exhibit, and the DSM-5 groups each trait into the broader term of SLD, this document will focus on the broader definition of the term. This broader approach to the definition will provide the student with more inclusive accommodations and the best chance of success in the music classroom.

2.4 Comorbidity

Comorbidity is the simultaneous existence of two or more medical conditions within the same patient. ADHD and dyslexia commonly present as comorbid conditions, as explained in the DSM-5:

Specific learning disorder commonly co-occurs with neurodevelopmental (e.g., ADHD, communication disorders, developmental coordination disorder, autistic spectrum disorder) or other mental disorders (e.g., anxiety disorders, depressive and bipolar mood disorders). These comorbidities do not necessarily exclude the diagnosis specific learning disorder but may make testing and differential diagnosis more difficult, because each of the co-occurring disorders independently interferes with the execution of activities of daily living, including learning.³⁶

³⁵ Ronald D. Davis, *The Gift of Dyslexia: Why Some of the Smartest People Can't Read... and How They Can Learn*, Updated, (New York: Penguin Group, 2010), 4.

³⁶ American Psychiatric Association, *DSM-5*, 74.

With regards to the frequency of ADHD/dyslexia comorbidity, Dr. Eva Germanò of the Division of Child Neurology and Psychiatry at the University of Messina, Italy, explains that the comorbidity between the two conditions is extremely common:

Over 80% of children with ADHD and 60% of children with reading disability meet the criteria for at least one additional diagnosis... Among psychiatric disorders, ADHD is the most frequently associated with dyslexia. Attention and learning problems usually are considered inter-related and on a continuum. Between the two disorders there is a bidirectional relationship since the comorbidity is very high if one examines children with dyslexia for ADHD or children with ADHD for dyslexia.³⁷

Dr. Murray Dyck of the School of Applied Psychology at Griffith University in Queensland, Australia, and Dr. Jan Piek of the School of Psychology and Speech Pathology at Curtin University in Perth, Australia, conducted a case study to determine the cause of developmental delays in children with ADHD, with specific interest in comorbidity. They tested 106 children, aged 6-14, 53 of which were being treated for ADHD, for 12 categories of developmental delays related to dyslexia symptoms: 1. perceptual organization, 2. verbal comprehension, 3. expressive language, 4. receptive language, 5. fine motor skills, 6. gross motor skills, 7. emotion recognition, 8. emotion understanding, 9. theory of mind, 10. response inhibition, 11. working memory accuracy, and 12. working memory speed.³⁸ “The results indicated that children with ADHD typically (85%) have at least one mild ability deficit, usually (55%) have at least one severe deficit, and usually (55%) have pervasive ability deficits.”³⁹ These “ability deficits” or impairments directly contributed to poor language and language-dependent abilities in the children with ADHD. Furthermore, “The results indicate a need for

³⁷ Eva Germanò, Antonella Gagliano, and Paolo Curatolo, “Comorbidity of ADHD and Dyslexia,” *Developmental Neuropsychology* 35, no. 5 (2010): 475-476.

³⁸ Dyck and Piek, “Developmental Delays in Children with ADHD,” 467.

³⁹ *Ibid.*, 474.

comprehensive screening for developmental disorders in children with ADHD and imply that research needs to focus on how ADHD and developmental disorders may share an etiology.”⁴⁰

Brain imaging technology is one method for screening for ADHD/dyslexia. However, as brain scans are expensive, present some degree of risk, and are not useful in predicting treatment response, it is not always prudent to use them as a primary diagnostic tool. Unfortunately, however, a clinical diagnosis of ADHD/dyslexia comorbidity is difficult to identify by other means because of the underlying similarities in symptoms between the two conditions. Further complicating the matter is the fact that a different professional diagnoses each condition: a health care provider, usually a psychiatrist or pediatrician, determines a potential ADHD diagnosis, while an educational diagnostician evaluates a child for dyslexia, or SLDs. Unfortunately, the two professionals largely work independently of each other. In some cases, psychiatrists will refer treatment of SLDs to an educational diagnostician while the educational diagnostician will refer students with ADHD to a medical professional. This non-sequitur makes a diagnosis difficult because of the lack of communication between professionals. Compounding the problem further is the fact that there is no “standardized” diagnostic test for ADHD: “an assessment for ADHD, which generally occurs in the offices of pediatricians and general family practitioners, is not standardized, leading to misdiagnoses, which include both over-diagnosis and under-diagnosis.”⁴¹ Dr. Guinevere Eden of the Department of Pediatrics and Director of the Center for the Study of Learning at Georgetown University explains,

⁴⁰ Ibid., 466.

⁴¹ Nancy A. Jackson, “A Survey of Music Therapy Methods and Their Role in the Treatment of Early Elementary School Children with ADHD,” *Journal of Music Therapy* 40, no. 4 (Winter 2003): 303.

Furthermore, the two conditions do not share diagnostic criteria and each is evaluated by different methods: ADHD by parent and teacher ratings of behavior and dyslexia by direct tests of reading performance... behavioral problems associated with ADHD disrupt learning to read, hence making the child appear dyslexic or, by the same logic, frustrations due to reading problems making the dyslexic child appear inattentive.⁴²

Eden explores two possible hypotheses for the existence of comorbid ADHD/dyslexia in her article, "ADHD and Developmental Dyslexia: Two Pathways Leading to Impaired Learning."

1.) The "phenocopy hypothesis" poses that the student with dyslexia appears to have inattentive ADHD because they have reading difficulties, as well as the inverse: the ADHD student appears to have reading problems because they have trouble concentrating. 2.) The "cognitive subtype hypothesis" postulates that both ADHD and dyslexia co-occur so commonly that the combination of the two might be considered a unique disorder because they have an etiological (genetic or environmental) link, or because common factors (genetic or otherwise) increase susceptibility to both disorders (e.g., if you have ADHD you may be more susceptible to developing dyslexia.)⁴³

After a child has received a comorbid diagnosis, it is standard practice to treat the ADHD with medication before remediating the symptoms of dyslexia:

Inattention and other symptoms of ADHD can adversely affect a child's performance in school and on standard ability tests, and so it has been standard practice to defer assessment of scholastic and other abilities in a child with ADHD until ADHD symptoms have been treated. This practice has been justified because it increases the chance of obtaining reliable and valid estimates of a child's abilities. However, given how frequently delays in acquiring language or motor skills accompany ADHD, this practice results in the underestimation of the severity and range of developmental problems among children with ADHD. Clinicians maybe prevented from recognizing that a child's inattention is due to impairments related to a language or motor skills disorder.⁴⁴

⁴² Eden and Vaidya, "ADHD and Developmental Dyslexia," 319.

⁴³ Ibid.

⁴⁴ Dyck and Piek, "Developmental Delays in Children with ADHD," 476.

Child and adolescent psychiatrist, Dr. Steven Pliszka, suggests the importance of determining “whether the patient meets the criteria for a separate comorbid disorder in addition to ADHD, the comorbid disorder is the primary disorder and the patient’s inattention or hyperactivity/impulsivity is directly caused by it, or the comorbid symptoms do not meet criteria for a separate disorder but represent secondary symptoms stemming from the ADHD.”⁴⁵ Psychological testing is needed to determine whether reading deficits, poor motor coordination, and poor mathematics skills are related to ADHD or SLDs. “In the vast majority of cases, these learning disorders will be comorbid with the ADHD, and it is recommended strongly that the patient’s ADHD be optimally treated before such testing. It could then be firmly concluded that any deficits identified are clearly the result of a learning disorder and not due to inattention to the test materials.”⁴⁶

Because the statistics point to ADHD/dyslexia having causal links, it is wise for an educator to be aware of the high comorbidity rates and the overlapping symptoms that might present in the learning environment. Because of the high likelihood of the coexistence of the conditions, a music educator might take the approach of teaching students with a single diagnosis of either ADHD or dyslexia as if they might have an undiagnosed comorbid condition.

2.5 Scientific Evidence of ADHD and Dyslexia

Advanced imaging technologies definitively show affected portions of the brain in individuals with neurodevelopmental disorders. Physical brain characteristics for both

⁴⁵ Steven Pliszka and the AACAP Work Group on Quality Issues, “Practice Parameter for the Assessment and Treatment of Children and Adolescents with Attention-Deficit/Hyperactivity Disorder,” *Journal of the American Academy of Child & Adolescent Psychiatry* 46, no. 7 (2007): 901.

⁴⁶ Ibid.

conditions present clearly on functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scans; overlapping abnormalities are apparent. “Structural and functional abnormalities in ADHD are primarily found bilaterally in frontal, striatal, and parietal areas as well as cerebellum whereas those in dyslexia are located in the inferior frontal, temporal and parietal cortices of the left hemisphere and cerebellum.”⁴⁷ Both conditions share deficiencies in the left hemisphere of the brain, namely the frontal lobe, cerebellum, and the parietal areas.⁴⁸ This discovery could explain similarities in symptoms/deficits between both conditions. Furthermore,

Characteristics of brain anatomy and brain function that distinguish ADHD and dyslexia from typical controls are shared in part across the two conditions... one would expect such overlap in the pathophysiology regardless of whether there is a common or separate etiology of ADHD and dyslexia (and hence a tendency for comorbidity) because similar brain anomalies may arise from different genetic or environment sources.⁴⁹

Regardless of the origin of the conditions or the cause for comorbidity, ADHD and dyslexia present with overlapping similarities on brain scans.

With ADHD in particular, scientists use electrophysiological methods to view activity in affected and under-utilized portions of the brain. In addition to fMRI and PET scans, researchers also use magnetic source imaging (MSI) and resonance spectroscopy (MRS) to decode and decipher the affected locations of the brain. fMRI scans show the presence of an anomalous growth in the corpus callosum area of the ADHD brain, which prevents the proper growth and stimulation of the prefrontal cortex, as well as the connection between the left and right

⁴⁷ Eden and Vaidya, “ADHD and Developmental Dyslexia,” 321.

⁴⁸ Ibid.

⁴⁹ Ibid., 320.

hemispheres of the brain.⁵⁰ “Posterior portions of the posterior callosum (connecting white matter fibers from the posterior frontal, parietal, and temporal lobes of the two hemispheres) is smaller in ADHD than in control subjects.”⁵¹ These anomalous growth patterns in the brain could contribute to the newly recognized cognitive problems associated with ADHD, such as poor processing speeds and executive functioning problems, as well as the typical behavioral symptoms including impulsivity, inattention, and hyperactivity.⁵²

ADHD is an inherited, genetic condition: “the mean heritability estimate of 76% shows that ADHD is among the most heritable of psychiatric disorders.”⁵³ Genetic chromosomal mutations affect the proteins and, therefore, the transmitters in the brain.⁵⁴ Scientists have isolated seven inherited gene mutations that could cause the condition:

...the many candidate gene studies of ADHD have produced substantial evidence implicating several genes in the etiology of the disorder. For the eight genes for which the same variant has been studied in three or more case-control or family-based studies, seven show statistically significant evidence of association with ADHD on the basis of the pooled odds ratio across studies: DRD4, DRD5, DAT, DBH, 5-HTT, HTR1B, and SNAP-25.⁵⁵

Because of the high instance of transmission across generations, a family history of ADHD can point to issues with children that exhibit ADHD symptoms.

Environmental factors may also contribute to ADHD symptoms. Studies of pre and post-natal cigarette smoke on lab mice demonstrate neurobehavioral alterations and increased

⁵⁰ Mary Gilliam et al., “Developmental Trajectories of the Corpus Callosum in Attention-Deficit/Hyperactivity Disorder,” *Biological Psychiatry* 69 (2011): 839; National Institute of Mental Health, “Attention Deficit Hyperactivity Disorder.”

⁵¹ Eden and Vaidya, “ADHD and Developmental Dyslexia,” 320.

⁵² Ibid.; American Psychiatric Association, *DSM-5*, 63.

⁵³ Eden and Vaidya, “ADHD and Developmental Dyslexia,” 320.

⁵⁴ Stephen V. Faraone et al., “Molecular Genetics of Attention-Deficit/Hyperactivity Disorder,” *Biological Psychiatry* 57 (2005): 1313-23.

⁵⁵ Ibid., 1313.

ADHD-like symptoms: a 125% increase in fighting, a 40% increase in locomotor activity, and a 37% decrease in striatal dopamine.⁵⁶ Mice exposed to the pesticide deltamethrin show increased levels of the D1 dopamine receptor, a contributor to behavioral deficits.⁵⁷ Common levels of dialkyl phosphate metabolites of organophosphates (pesticide) in the urine of children 8 to 15 years of age may contribute to ADHD prevalence, with symptoms of behavioral problems and lower cognitive function.⁵⁸

New dyslexia research examines how changes in glucose, or shifts in blood flow to the brain, electrical activity, magnetic fields, and changes in brain chemistry affect symptoms of dyslexia.⁵⁹ Dyslexia researcher, Sally Shaywitz, used fMRI techniques to capture blood flow images of thousands of children and adults as a means of studying which parts of the brain light up during different tasks. She discovered an interruption of blood flow to the proper places in the left side of the dyslexic brain. As a result, the dyslexic brain compensates for this disruption by using other parts of the brain that are atypical for certain tasks.⁶⁰ Brain imaging scans can detect these left-brain development deficiencies, noting “anomalous patterns of neural activation associated with reading and phonological” problems in people with dyslexia and/or SLDs.⁶¹ Studies “have localized dysfunctional phonological representations in dyslexia when compared to controls, specifically in left-hemisphere temporo-parietal and occipito-temporal

⁵⁶ Carrie Yochum et al., “Prenatal Cigarette Smoke Exposure Causes Gender-Specific Neurobehavioral Alterations Reminiscent of ADHD with Increased Aggression,” *Neurotoxicology and Teratology* 33, no. 4 (July-Aug 2011): 501.

⁵⁷ Jason Richardson, “Developmental Pesticide Exposure: A New Risk Factor for ADHD?” *Neurotoxicology and Teratology* 30, no. 3 (May-June 2008): 251.

⁵⁸ Maryse F. Bouchard, et al., “Attention-Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides,” *Pediatrics* 125, no. 6 (June 2006): 1270-77.

⁵⁹ Vellutino, et al., “Specific Reading Disability (Dyslexia),” 20.

⁶⁰ Liz Dunoon, *Helping Children with Dyslexia*, 51.

⁶¹ Eden and Vaidya, “ADHD and Developmental Dyslexia,” 321.

cortices.”⁶² There has also been a reporting of hypoactivity in the left occipito-temporal junction and in the parietal cortex during phonological processing tasks, as well as in the left inferior frontal gyrus during certain tasks.⁶³

Other dyslexia experts, John Stein and Silvia Paracchini, focus their research on the genetic aspects of the disability. Stein developed the Magnocellular Theory of Dyslexia. Magnocellular nerve cells are responsible for processing auditory and visual cues from the eyes and ears and for firing this information to the brain, which then decides what to do with the information. These nerve cells develop differently in fetuses with dyslexia. Silvia Paracchini’s research discovered a reduction in levels of protein, causing variants in chromosomes 3, 6, and 15 in fetuses, affecting visual, auditory, and motor coordination.⁶⁴

Uniquely, research has noted a strong connection between otitis media (middle ear infections) and ADHD/dyslexia. Chronic childhood ear infections can increase the propensity for dyslexia, “MSNH [mild to moderate sensorineural hearing loss] is associated not only with lower hearing thresholds, but also distortion of speech signals and degraded language input, which may affect the development of the phonological representations of spoken words and other phonological processing skills.”⁶⁵ In addition to the problems associated with early childhood ear infections and dyslexia, there is also an important link between middle ear infections and ADHD:

Otitis media (OM) is common during the first three years of life when speech and language categories are formed. In research assessing children with and without OM,

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Dunoon, *Helping Children with Dyslexia*, 56-60.

⁶⁵ Jungjun Park and Linda J. Lombardino, “A Comparison of Phonological Processing Skills of Children with Mild to Moderate Sensorineural Hearing Loss and Children with Dyslexia,” *American Annals of the Deaf* 157, no. 3 (Summer 2012): 300.

children with OM had lower scores on measures of phonological awareness, rhyme and non-word reading, semantic skills of expressive vocabulary, word definitions, and reading. An early history of middle ear infection can be associated with deficits in language and literacy development. In a study of children with ADHD or LD, children with ADHD had significantly more middle ear infections. The findings indicated that OM can co-occur with ADHD.⁶⁶

Also, as the brains of infants and children are sensitive to even low levels of environmental neurotoxicants, exposure can interfere with normal development and cause long-lasting, irreversible effects.⁶⁷ According to the National Academy of Sciences, a mother's exposure to toxic chemicals and environmental agents while pregnant causes 3% of brain developmental disorders. Another 25% may result from an environmental insult occurring in conjunction with a genetic predisposition.⁶⁸ Oxford scientist, Alexandra J. Richardson, is researching the effects of Omega-3 fatty acids on the development of children with both ADHD and dyslexia. She posits that a deficiency of Omega-3 magnifies the negative symptoms of both conditions. She conducted clinical trials of Omega-3 supplement programs to determine if increases of fatty acids help offset those symptoms.⁶⁹ Follow up studies point to positive results with Omega-3 supplements, although more placebo-controlled trials are required. Most scientists agree that while the supplements may help decrease symptoms, methylphenidates are more effective treatments for symptoms of ADHD.⁷⁰ As fatty acid supplements anecdotally

⁶⁶ Ilean Padolsky, "The Neuropsychological and Neurobehavioral Consequences of ADHD Comorbid with LD and Otitis Media," *Journal of Developmental and Physical Disabilities* 20, no. 1 (February 2008), 12.

⁶⁷ Amir Miodovnik, "Environmental Neurotoxicants and Developing Brain," *Mount Sinai Journal of Medicine* 78, no. 1 (Jan 2011): 58-77.

⁶⁸ National Research Council, *Scientific Frontiers in Developmental Toxicology and Risk Assessment*, (Washington, D.C.: National Academy Press, 2000), 10.

⁶⁹ A.J. Richardson, "Clinical Trials of Fatty Acid Treatment in ADHD, Dyslexia, Dyspraxia, and the Autistic Spectrum," *Prostaglandins, Leukotrienes, and Essential Fatty Acids* 70, no. 4 (April 2004): 383-390; A.J. Richardson, "Omega-3 fatty acids in ADHD and related neurodevelopmental disorders," *International Review of Psychiatry* 18, no. 2 (April 2006): 155-172.

⁷⁰ Anja Königs and Amanda J. Kiliaan, "Critical Appraisal of Omega-3 Fatty Acids in Attention-Deficit/Hyperactivity Disorder Treatment," *Neuropsychiatric Disease and Treatment* 12 (July 2016): 1877.

help with symptoms of dyslexia, scientists are finding it difficult to test this hypothesis because of difficulties with variables, such as “unified diagnostic criteria for dyslexia, objective measures of fatty acid deficiency, and close monitoring of dietary intake.”⁷¹

⁷¹ Michal Zelcer and Ran D. Goldman, “Omega-3 and Dyslexia: Uncertain Connection,” *Canadian Family Physician* 61, no.9 (September 2015): 768.

CHAPTER 3

UNDERSTANDING THE LAWS

3.1 Introduction

The United States federal government has openly recognized the existence and prevalence of ADHD/dyslexia through the introduction of several pieces of legislation aimed at protecting the rights of students with these disabilities attending public schools. Current rules and regulations reflect the growing need for consistent, early intervention and accommodative services. The laws focus primarily upon 1.) history, 2.) definitions and terminology, 3.) early screening, 4.) identification, 5.) accommodations or interventions, and 6.) eligibility for services. In today's public school system, students with ADHD/dyslexia are given the opportunity to succeed, as teams of special educators, counselors, administrators, and classroom teachers make every effort to help the student move through the levels of the system successfully in order to graduate. School systems have changed their approach towards students with disabilities in an attempt to comply with these laws. This chapter will focus upon the laws that are most important for helping to integrate music students with disabilities into the public school system, as well as the middle school music curriculum that is required by Texas state law.

3.2 Rehab Act, ADA, IDEA, FERPA

President Richard Nixon signed the Rehabilitation Act of 1973 (Rehab Act) into law on September 26, 1973,

to replace the vocational rehabilitation act, to extend and revise the authorization of grants to states for vocational rehabilitation services, with special emphasis on services

to those with the most severe handicaps, to expand special federal responsibilities and research and training programs with respect to handicapped individuals, to establish special responsibilities in the secretary of health, education, and welfare for coordination of all programs with respect to handicapped individuals within the department of health, education, and welfare, and for other purposes.⁷²

The Rehab Act contains several sections. Section 504 makes it illegal for agencies, programs, or activities that receive federal financial assistance or are conducted by a federal agency to discriminate against qualified individuals with disabilities. It states that “no qualified individual with a disability in the United States...shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program conducted by any Executive agency or the United States Postal Service.”⁷³ It requires reasonable accommodations for individuals with disabilities, program accessibility, communication accessibility, and new construction accessibility. Each federal agency must adhere to its own set of Section 504 regulations. While the U.S. Department of Health and Human Services makes sure that clinics, doctors’ offices, and medical equipment are accessible to people with disabilities, the U.S. Department of Education insures that students with disabilities receive the educational services and accommodations they need to succeed in school.

On July 26, 1990 President George H.W. Bush signed into law the Americans with Disabilities Act of 1990 (ADA), a comprehensive civil rights law that prohibits discrimination on the basis of disability. On September 25, 2008 President George W. Bush signed into law the Americans with Disabilities Amendments Act of 2008, which amends the ADA definition of

⁷² Rehabilitation Act of 1973, Public Law 93-112, 87 Statute 355, 29 U.S. Congress § 794 (September 26, 1973), accessed January 7, 2016, http://www.eeoc.gov/eeoc/history/35th/thelaw/rehab_act-1973.html.

⁷³ Section 504, Rehabilitation Act of 1973, Public Law 93-112, 87 Statute 355, 29 U.S. Congress § 701, (September 26, 1973), accessed January 11, 2016, <http://www.dol.gov/oasam/regs/statutes/sec504.htm>.

disability, clarifies its coverage, and provides guidance on the application of the definition. In essence, the ADA “prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation.”⁷⁴ The ADA defines disability “with respect to an individual, as a physical or mental impairment that substantially limits one or more of the major life activities of such individual; a record of such an impairment; or being regarded as having such an impairment.” The phrase “physical or mental impairment” includes neurological and physiological disorders, as well as SLDs. The ADA does not specifically name all of the covered disabilities or impairments.⁷⁵ Title III, Part 36 of the ADA specifies nondiscrimination on the basis of disability through accommodations in public and commercial facilities. In particular, special requirements, or “alternative accessible arrangements,” must be offered for courses required for secondary and postsecondary education:

- (1) Any private entity that offers a course covered by this section must make such modifications to that course as are necessary to ensure that the place and manner in which the course is given are accessible to individuals with disabilities.
- (2) Required modifications may include changes in the length of time permitted for the completion of the course, substitution of specific requirements, or adaptation of the manner in which the course is conducted or course materials are distributed.
- (3) A private entity that offers a course covered by this section shall provide appropriate auxiliary aids and services for persons with impaired sensory, manual, or speaking skills, unless the private entity can demonstrate that offering a particular auxiliary aid or service would fundamentally alter the course or would result in an undue burden. Auxiliary aids and services required by this section may include taped texts, interpreters or other effective methods of making orally delivered materials available to individuals with hearing impairments, Brailled or large print texts or qualified readers for individuals

⁷⁴ The Americans with Disabilities Act of 1990, Public Law 101-336, §§ 35-36, 108th Congress, 2nd Session (July 26, 1990), accessed January 7, 2016, http://www.ada.gov/2010_regs.htm.

⁷⁵ The Americans with Disabilities Act of 1990, Public Law 101-336, § 36.104, 108th Congress, 2nd Session (July 26, 1990), accessed January 7, 2016, http://www.ada.gov/regs2010/titleIII_2010/titleIII_2010_regulations.htm#a104.

with visual impairments and learning disabilities, classroom equipment adapted for use by individuals with manual impairments, and other similar services and actions.

(4) Courses must be administered in facilities that are accessible to individuals with disabilities or alternative accessible arrangements must be made.

(5) Alternative accessible arrangements may include, for example, provision of the course through videotape, cassettes, or prepared notes. Alternative arrangements must provide comparable conditions to those provided for nondisabled individuals.⁷⁶

All students must have access to the classes and music ensembles that are offered to the general public school population. If students with disabilities are denied access to the music classroom or ensembles because of their disability, the school is in violation of federal law.

The office of Civil Rights is responsible for eliminating discrimination against students with disabilities by enforcing Section 504 of the Rehab Act and Title II of the ADA. Section 504 regulations require school districts to provide a “free appropriate public education” to every qualified student regardless of the nature or severity of the disability by providing related aids and services designed to meet the individual’s specific educational needs as adequately as those of nondisabled students. An “appropriate education” could consist of education in regular classrooms, education in regular classrooms with supplementary services, and/or special education in special classrooms. Both Section 504 and the ADA are antidiscrimination laws that do not provide funding.

The Office of Special Education and Rehabilitative Services, a subsidiary of the U.S. Department of Education, administers the Individual with Disabilities Education Act of 2004 (IDEA), a grant statute with very specific conditions that funds special education programs.

⁷⁶ The Americans with Disabilities Act of 1990, Public Law 101-336, § 36.309, 108th Congress, 2nd Session (July 26, 1990), last modified March 8, 2012, accessed January 7, 2016, http://www.ada.gov/regs2010/titleIII_2010/titleIII_2010_regulations.htm#a309.

These funds are given to each state's educational agency, which then distributes the funds to public elementary and secondary schools. Part A caters to infants and toddlers with disabilities from birth to two years of age, while Part B of IDEA offers special education and related services to children and youth ages 3-21. These funds are used for students whose mental and/or physical impairments affect that student in a major life activity: caring for one's self, performing manual tasks, using all of the senses, reading, concentrating, thinking, communicating, etc. At the postsecondary level, however, the schools receiving the funds are required to provide students with appropriate academic adjustments and auxiliary aids and services in order to give an individual with disabilities an equal opportunity to participate in a school's program. It is not required, however, to provide services, aids, or fundamental alterations that would cause an undue burden to the program.⁷⁷

President George W. Bush signed IDEA into law on December 3, 2004 in alignment with the No Child Left Behind Act (NCLB) of 2001. The purpose of NCLB was to hold under-performing schools more accountable by requiring states to develop assessments in basic skills. In order to receive federal funding, the state needed to show adequate yearly progress in standardized test scores, employ "highly qualified" teachers for all students (including to those with disabilities), allow for school choice in the case of under-performing schools, and provide incentives to schools showing progress with students with disabilities, especially when they allow students with disabilities to participate in standardized testing. NCLB and IDEA work together by providing individualized instruction and school accountability for students with disabilities. President Barack Obama replaced NCLB with the Every Student Succeeds Act on

⁷⁷ Office for Civil Rights, "Protecting Students with Disabilities," United States Department of Education, last modified October 16, 2015, accessed January 7, 2016, <http://www2.ed.gov/about/offices/list/ocr/504faq.html>.

December 10, 2015, which included reforms on standardized testing, a pre-K program, and a provision to prevent schools from exempting large numbers of students from standardized testing.

The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. This law applies to all schools that receive funds from the U.S. Department of Education. Parents and students have the right to inspect and review the student's education records maintained by the school, request that the school amend records that the parent believes to be inaccurate or misleading, and the school must have written permission from the parent to release any information from a student's education record with few exceptions: under a lawful judicial order or subpoena, to appropriate officials in cases of health and safety emergencies, to specified officials for evaluation purposes, or to transfer schools.⁷⁸

3.3 IEP vs. 504 Plan

IDEA requires that public schools create an Individual Education Program (IEP), a legally binding document, for every child receiving special education services as a means of addressing each child's unique learning issues and educational goals. There is a 10-step process:

1. The child is identified as needing an evaluation for special education services or accommodations. The parent gives consent to have the child evaluated at the expense of the school district.
2. The child is evaluated and the results decide whether the child is eligible for special education and related services. If the parent disagrees with the evaluation, they have

⁷⁸ Family Educational Rights and Privacy Act (FERPA), 20 U.S. Congress § 1232g, 34 CFR Part 99, last modified June 26, 2015, accessed September 25, 2016, <http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html>.

the right to get an independent educational evaluation and may ask the school system to pay for it.

3. Eligibility is decided by a group of qualified professionals. If the school determines that the child does not fall under IDEA's definition of a child with disability, the parents may ask for a hearing to challenge the decision.

4. The child is deemed eligible for special education and related services. A team of educators, counselors, administrators, and parents, in consultation with psychiatrists and advocates, schedule a meeting within 30 calendar days to develop and write the best plan of action, or IEP, for the individual student.

5. The IEP meeting is scheduled. The parents must be given every opportunity to attend and may invite their own specialists/activists to the meeting.

6. An Admission, Review, and Dismissal (ARD) committee (Texas), otherwise known as an IEP team (federal), meets to determine the least restrictive environment for delivering the student/s intervention, and writes the IEP. The parent receives a copy of the IEP and gives consent for the school system to begin implementing services for the first time. If the parents disagree, they may discuss and work out an agreement with the IEP team, may ask for mediation, or may file a complaint with the state education agency and request a due process hearing.

7. The school provides services. Each of the child's teachers have access to the IEP, are given specific responsibilities, and are expected to carry out those responsibilities.

8. The school measures the child's progress annually and reports to the parents.

9. The IEP is reviewed at least annually, or more often if the parents request it, and is revised if necessary.

10. The child is reevaluated every 3 years to determine if the child continues to have the disability as defined by IDEA and is still eligible for services.⁷⁹

Under Section 504 of the Rehab Act, one way to meet the requirements for a free appropriate public education is to implement an IEP—IDEA procedures meet the requirements

⁷⁹ Office of Special Education & Rehabilitative Services, "A Guide to the Individualized Education Program," U.S. Department of Education, last modified March 23, 2007, accessed January 9, 2016, <http://www2.ed.gov/parents/needs/speced/iepguide/index.html>.

for Section 504.⁸⁰ A student with a disability may fall under the scope of Section 504 instead of IDEA because, while their disability is “substantially limiting and therefore affecting a major life activity,” it does not warrant the more specialized services provided within an IEP.⁸¹ If the student’s disability substantially limits the student’s learning and falls within the scope of Section 504, then they must receive special services, accommodations, and/or modifications that allow them to receive as adequate of an education as a student without disabilities.⁸²

While all of the student’s teachers are both allowed access to IEPs, and are legally responsible for implementing them, in reality, most music educators are unaware of which students have IEPs or how to implement them. In “A Survey of Music Educators’ Involvement in the Individual Education Program Process and Their Knowledge of Assistive Technology,” 201 K-12 music educators were asked about their involvement in the IEP process and more than half admitted to not participating in IEP development.⁸³ Music educators should both review each IEP at the start of the school year and consider being a part of the IEP team, which will help them provide better assistance to students with disabilities. It is often a major challenge to find a time when music teachers, administrators, the special education team, and parents can meet.

3.4 Texas Laws

Some states choose to compose additional state-imposed rules, regulations, and policies related to special education services or accommodations that are not required by IDEA or

⁸⁰ Office for Civil Rights, “Protecting Students with Disabilities,” United States Department of Education, last modified October 16, 2015, accessed January 7, 2016, <http://www2.ed.gov/about/offices/list/ocr/504faq.html>; Texas Education Agency, *The Dyslexia Handbook*, 60.

⁸¹ *Ibid.*, 19, 60.

⁸² *Ibid.*, 60.

⁸³ Kimberly McCord and Emily H. Watts, “Collaboration and Access for Our Children: Music Educators and Special Educators Together,” *Music Educators Journal* 92, no. 4 (2006): 28.

federal regulations. As part of an annual state application to receive federal funding, states must inform local educational agencies (LEAs) in writing of such additional policies. In Texas, these special education rules are established by the SBOE as well as the state Commissioner, and are compiled and published as the Texas Administrative Code (TAC.) The Commissioner and SBOE's special-education rules are found in the TAC, Title 19, Part II, Chapter 89. *The Dyslexia Handbook- Revised 2007, Updated 2010: Procedures Concerning Dyslexia and Related Disorders (Dyslexia Handbook)*, published by the TEA contains the SBOE approved procedures concerning dyslexia and related disorders.⁸⁴ The Dyslexia Handbook provides guidelines for school districts to follow regarding the identification and provision of services for students with dyslexia, and information regarding the state's dyslexia statutes in relation to the federal laws. The TEC includes laws and rules passed by the state legislature and are supported in whole or in part by state tax funds.

The TEKS protocol is a mandate under Title 19, Chapter 74 of the TAC for required core curriculum subjects in grades K-12, including math, English language arts, science, social studies, and an enrichment curriculum that includes fine arts (art, dance, music, or theater).⁸⁵ As of 2010, the state of Texas made it a requirement that students complete one year of a Texas essential knowledge and skills-based fine arts course in middle school (grades 6-8) and one year in high school (grades 9-12.)⁸⁶ The subjects that encompass the fine arts curriculum include music (band, orchestra, choir), theater, dance, and visual art. The TEKS 6th grade music

⁸⁴ Texas Education Agency, *The Dyslexia Handbook*.

⁸⁵ Curriculum Division, "Texas Essential Knowledge and Skills," Texas Education Agency, accessed April 14, 2014, <http://tea.texas.gov/curriculum/teks/>.

⁸⁶ Texas Education Code, Title 2, Subtitle F, Ch. 28, Subchapter A, § 28.002, amended by Acts 2015, 84th Leg., R.S., Ch. 1175 (S.B. 968), Sec. 1 (June 19, 2015), accessed September 25, 2016, <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.28.htm#28.002>.

curriculum requires an extensive command of knowledge including: 1.) the ability to describe, analyze, and demonstrate musical sound and artistry, 2.) the use of musical terminology, 3.) the aural and visual identification of musical forms, 4.) accurate individual, small and large group performances of music representing diverse styles and cultures from memory and notation, 5.) sight-reading, 6.) aural skills, 7.) improvisation, composition, and arranging, 8.) the ability to relate music to history, society, culture, and other fine arts, and 9.) the ability to evaluate and critique compositions and performances.⁸⁷

Because most public schools in Texas begin instrumental studies in 6th grade, most middle school students choose to fulfill their fine arts requirement in 6th grade. While most students with ADHD/dyslexia will be able to achieve the majority of the TEKS requirements for music in 6th grade (depending on the severity of their disability), they may struggle with certain aspects of the curriculum. Teacher flexibility in implementing and/or modifying the TEKS curriculum may be required. As a result, music educators must be prepared to provide accommodations for band students with IEPs and 504 plans starting in 6th grade. Therefore, this document will focus mainly on accommodation to the 6th grade TEKS, Chapter 117, section 3 (Music, Grade 6.)⁸⁸

Government websites like ed.gov, tea.state.tx.us, and tmea.org provide information about IEPs and TEKS separately, however, there are currently no IEP guidelines, resources, or protocol for band directors or private instructors who must adhere to the TEKS curriculum requirements within the Texas Music Educators Association (TMEA) system. There are a few

⁸⁷ Curriculum Division, "Texas Essential Knowledge and Skills."

⁸⁸ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

advocates for music students with IEPs, including Kimberly McCord and Emily H. Watts, who write extensively for the *Music Educator's Journal*. These authors believe in interactive, multisensory approaches that include assistive technology, and argue the importance of a good working relationship between music educators and special educators.⁸⁹

⁸⁹ McCord and Watts, "Collaboration and Access for Our Children," 26-33.

CHAPTER 4

OBSERVING, IDENTIFYING, AND REMEDIATING MUSICAL ISSUES

IN THE CLASSROOM AND THE LESSON

4.1 Introduction

The awareness and identification of music-specific deficiencies is critical when educating the beginner student with ADHD/dyslexia. While a lack of practice or a beginner learning curve can contribute to musical learning difficulties, the understanding of ADHD/dyslexia-specific traits could empower a teacher to distinguish between the struggles of a neurotypical beginner and the added difficulties of students with ADHD/dyslexia. “While some dyslexics face little to no challenge in learning music, others find it immensely frustrating. Some of the trickiest concepts to master include music notation, sight-reading, deciphering rhythm, memorization of melodic and rhythmic repetition, and maintaining a steady beat.”⁹⁰ If a student has an existing 504 plan or IEP for ADHD/dyslexia, the music teacher should be aware of the following traits:

4.2 Time and Pulse

Many students with ADHD/dyslexia will find counting, tapping, playing with a metronome pulse or subdividing rhythms evenly across time to be difficult.⁹¹ Because of the connection between left-brain deficits in students with dyslexia and musical timing being controlled in the left hemisphere of the brain, a great number of students with dyslexia could

⁹⁰ Kenneth J. Bryson, “Teaching a Student with Dyslexia,” *Journal of Singing* 69, no. 4 (March-April 2013): 431.

⁹¹ Katie Overy, “Dyslexia and Music: from Timing Deficits to Musical Intervention,” *Annals of the New York Academy of Sciences* 999, no. 1 (2003): 499, 503; Luiz Rogerio and Jorgensen Carrer, “Music and Sound in Time Processing of Children with ADHD,” *Frontiers in Psychiatry* 6, no. 127 (September 2015): 1-7.

struggle with these skills, especially when combined with an auditory processing deficiency.⁹²

New discoveries into temporal region dysfunctions in the ADHD brain, could explain timing deficits in music students with ADHD, regardless of a comorbid dyslexia diagnosis.⁹³

In 2008, Dr. Jennifer Thomson at the Centre for Neuroscience in Education at the University of Cambridge conducted an experiment to determine the links between paced motor tapping, auditory rhythmic processing, and written language development in a set of 48 ten-year-old children—25 with a diagnosis of specific reading difficulties and 23 typically-developing readers. She “assessed rhythmic motor ability in both paced (where a metronome beat was continuously present) and unpaced (the beat ceased but children continued tapping) conditions,” using Presentation computer software.⁹⁴ The children had to tap along with the beat for 20 seconds by clicking a mouse button (they each had a 30-second practice period before starting the test) and had to continue tapping for 20 seconds after the metronome ceased. The children tested at a variety of metronome speeds. Thomson’s results suggested “a specific difficulty for dyslexic children in synchronizing motor behaviour to an external auditory rhythm.”⁹⁵ Both neurotypical children and those with dyslexia had an equally difficult time of keeping a steady beat without the metronome. The utilization of external beat mechanisms (tapping the shoulder, rocking the student), “Orff” or Dalcroze based education techniques

⁹² Eden and Vaidya, “ADHD and Developmental Dyslexia,” 321; Overy, “Dyslexia and Music: from Timing Deficits,” 502; Katie Overy, et al., “Dyslexia and Music: Measuring Musical Timing Skills,” *Dyslexia* 9, no. 1 (2003): 32.

⁹³ Germanò, Gagliano, and Curatolo, “Comorbidity of ADHD and Dyslexia,” 480.

⁹⁴ Jennifer M. Thomson and Usha Goswami, “Rhythmic Processing in Children with Developmental Dyslexia: Auditory and Motor Rhythms Link to Reading and Spelling,” *Journal of Physiology-Paris* 102, nos. 1-3 (January 2008): 124.

⁹⁵ *Ibid.*, 128.

(eurhythmics, walking around to the beat, throwing a ball in time) or other multisensory approaches and games could help to remediate these difficulties.⁹⁶

The inconsistencies between counting systems in middle school (Eastman counting system: “1 ti te ta” or the basic: “1 e & a”) and the Kodaly counting system used at the elementary level (“tah” for quarter notes, “tee” for eighth notes and tika-tika for sixteenth notes) can present a frustrating paradox in the mind of the learner with ADHD/dyslexia, making it nearly impossible to be successful with a suddenly new counting system in 6th grade.⁹⁷ The dyslexic brain has an impressive ability to commit facts to long-term memory, especially when learned in the context of a story, making it very difficult to change previously learned information. In his book, *The Gift of Dyslexia*, Ronald D. Davis (founder of Davis Dyslexia Association International and the Reading Research Council) describes the “gift of dyslexia” as a gift of mastery.⁹⁸

Mastery is more than just fast learning. Mastery is a level of learning where conscious thought is no longer required. It is the ability to own the data learned as actual experience. When something is mastered, there is no need to worry about being able to remember it- it’s probably impossible to forget... It becomes part of the individual’s thought and creative process. It adds the quality of its essence to all subsequent thought and creativity of the individual.⁹⁹

Having an in-depth understanding of the elementary music education curriculum will help the beginner band director to access the student’s previous knowledge base by building upon the student’s elementary music education background. The use of “Orff” word rhythms (e.g., the use of three syllable words like raspberry to describe triplets) can also assist a student

⁹⁶ Sheila Oglethorpe, *Instrumental Music for Dyslexics*, 12, 39.

⁹⁷ Colleen Richardson, “Teaching Students to Be Rhythmically Independent,” *Musicien éducatrice au Canada* 49, no. 3 (Spring 2008): 41.

⁹⁸ *Ibid.*, 6; Eide and Eide, *The Dyslexic Advantage*, 221.

⁹⁹ Ronald D. Davis, *The Gift of Dyslexia: Why Some of the Smartest People Can’t Read... and How They Can Learn*. Updated. (New York: Penguin Group, 2010), 115.

in understanding how to divide the time evenly across a given beat according to the specified rhythm.¹⁰⁰

As with most musical training, patience and repetition can be most beneficial. The pupil with ADHD/dyslexia is capable of learning all of the time and rhythm skills required in music, however, multiple instructive sessions will be needed to solidify the information, as well as a multi-faceted, multi-modal approach.¹⁰¹ Liz Dunoon believes in a simple, repetitive daily practice routine for the acquisition of literary skills, which could also be applied to music training: “Regular practise not only makes perfect. It also makes permanent... Daily repetitive practice to learn and remember new information has a simple, scientifically proven premise—brain neurons that fire together wire together, helping to make learning permanent.”¹⁰² By providing the information in multiple ways and by building upon previous knowledge, learners with ADHD/dyslexia will have a better chance of mastering the material and/or finding the method that works best for them.

4.3 Note Reading and Processing

To be able to process and read music, the brain must access the same regions as it does when learning to read. In their article, “A Case Study of Music and Text Dyslexia,” Sylvie Hebert, *et al.* explain that, “Some crucial components of music-reading, as well as text reading, seem to

¹⁰⁰ Katie Overy, “Classroom Rhythm Games for Literacy Support,” in *Music and Dyslexia: a Positive Approach*, ed. Tim Miles, John Westcombe, and Diana Ditchfield, (Chichester, England: John Wiley, 2008), 34-38; Jane Frazee, *Discovering Orff*, (New York: Schott Music Corporation, 1987), 14-19.

¹⁰¹ Ogelthorpe, *Instrumental Music for Dyslexics*, 1; Diana Ditchfield, “The Paperwork” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 78; Bryson, “Teaching a Student with Dyslexia,” 431.

¹⁰² Dunoon, *Helping Children with Dyslexia*, 36-37.

rely heavily on the posterior part of the left hemisphere.”¹⁰³ Marie Forgeard of the Music and Neuroimaging Laboratory at the Beth Israel Deaconess Medical Center Department of Neurology in Boston believes that the same brain region is used in speech and non-speech sounds: “fMRI studies have also shown that rapid temporal information processing occurs in the same left-hemisphere brain regions irrespective of whether the processing involves speech or nonspeech information.”¹⁰⁴

Note reading and text reading also involve similar literacy skills: “Reading music notation requires the same decoding of symbols (moving from left to right, pattern recognition, mapping of sounds to symbols) used by written language, and thus may very well generalize to the development of both language processing and reading skills.”¹⁰⁵ As with phonemic dyslexia-related remediation, early identification and remediation is crucial for the acquisition of musical notation reading.¹⁰⁶ The same is true for students with ADHD, “Given the less-than-favorable prognosis for children with ADHD, it is imperative that empirically supported interventions are implemented early, particularly during the elementary school years.”¹⁰⁷ Elementary music programs can greatly benefit a student with ADHD/dyslexia, as the pace of note learning and reading is slow and methodical.¹⁰⁸ Students have time to solidify their note-reading skills in fun,

¹⁰³ Sylvie Hebert, et al., “A Case Study of Music and Text Dyslexia,” *Music Perception* 25, no. 4 (2008): 369.

¹⁰⁴ Forgeard, “The Relation Between Music and Phonological Processing,” 383.

¹⁰⁵ *Ibid.*, 384.

¹⁰⁶ Karen E. Dakin and Gerald Erenberg, “Attention-Deficit/Hyperactivity Disorder (AD/HD) and Dyslexia Fact Sheet,” International Dyslexia Association, accessed February 10, 2016, <http://eida.org/attention-deficithyperactivity-disorder-adhd-and-dyslexia/>.

¹⁰⁷ George J. DuPaul, “ADHD in the Classroom: Effective Intervention Strategies,” *Theory Into Practice* 50, no. 1 (2011): 36.

¹⁰⁸ Tim Miles, “Parallels Between the Teaching of Musical and Mathematical Notation,” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 73.

multisensory ways through reading games, singing, and the use of simple percussion instruments or plastic recorders before the addition of full-sized musical instruments.

Students with ADHD/dyslexia may have trouble with note reading because of a lack of spatial or directional awareness. For instance, it is especially common for a student with dyslexia to flip notes on lines or spaces in the staff (playing a B instead of D or A instead of C), flip the sequential order of notes, or have trouble equating up and high versus down and low.¹⁰⁹ Students with directional confusion may struggle with learning the notes of the bass and/or treble staves.¹¹⁰ When changing notes, that same student might recognize the letter name of the following note, finger it properly, but still play it incorrectly, because of a lack of directional awareness (the ability to decipher if a musical line moves up or down the music staff.) Some students with ADHD/dyslexia might lose their place going from the far right edge of the page to the beginning of the next line or read the same line twice, which is a common occurrence in text reading.¹¹¹ Students who have learned a mnemonic device for the notes of the staff (Every Good Boy Does Fine) may even read them in the wrong direction.

Other note reading problems can be attributed to visual processing difficulties. In these cases, it is possible that the student is not seeing the text of the music clearly:

Striped patterns can be unpleasant to look at and some people experience eye strain and visual perceptual distortions when viewing these... Lines of print on a page form a striped pattern, which can have the spatial properties that may cause pattern glare. It seems likely that this mechanism is responsible for at least some patients' symptoms of 'visual stress' when reading...¹¹²

¹⁰⁹ Ogelthorpe, *Instrumental Music for Dyslexics*, 5-6.

¹¹⁰ *Ibid.*

¹¹¹ Dunoon, *Helping Children with Dyslexia*, 11.

¹¹² Isla Kriss and Bruce J.W. Evans, "The Relationship Between Dyslexia and Meares-Irlen Syndrome," *Journal of Research in Reading* 28, no. 3 (2005): 351.

It is also possible that the student is not processing the information that they see fast enough:

Systematic studies of executive functions that have included well-controlled samples of ADHD, dyslexia, and co-morbid groups (ADHD plus dyslexia) indicate that while each disorder exhibits the deficits characteristic for each disorder (e.g., poor response inhibition in ADHD, phonological coding deficits in dyslexia, and both in the co-morbid groups), all groups also exhibit abnormalities with processing speed and verbal working memory.¹¹³

It is necessary to first rule out any physical impairment in the eyes and to determine if corrective lenses are needed. Ophthalmologist, Dr. Patrick Quercia of the University of Burgundy Hospital in Dijon, France says,

In the visual sphere, it is essential that all dyslexics receive comprehensive ophthalmological examinations, including cycloplegia, to uncover masked hyperopia as well as to perform a detailed analysis of ocular motility and accommodative power. All refractive disorders must be corrected since they may aggravate difficulties in decoding, and they can impede attention by excessively soliciting accommodation.¹¹⁴

If there are no physical problems with the eyes, but the student continues to have difficulty “seeing” the music, a teacher should ask the following questions:

- 1.) Can the student name the notes on the staff while using a finger as a cursor?
- 2.) Has the student learned the spaces and lines adequately enough to identify what the note is? For instance, can the student distinguish between the 2nd and 3rd space in a stave or recall a mnemonic device for the note names? This question should distinguish between a beginner learning curve problem versus a problem with visual processing.

¹¹³ Eden and Vaidya, “ADHD and Developmental Dyslexia,” 319-320.

¹¹⁴ Patrick Quercia, Leonard Feiss, and Carine Michel, “Developmental Dyslexia and Vision,” *Clinical Ophthalmology* 7 (May 2013): 876.

3.) Is there a glare on the page making it difficult to process tiny notes on black and white paper?

After visual impairment has been eliminated as a possibility and the student exhibits the requisite knowledge base without an instrument, multisensory learning aids can be used: colored overlays, colored paper, highlighters, large musical staves taped on the floor, etc.¹¹⁵ Using symbols for up/down, left/right, high/low and/or forward/backward can assist in the speed at which the notes can be processed. Preschool books and beginner band books both use large font sizes, making the symbols easier to see and interpret. The simple act of enlarging a piece of music may clear up any confusion or difficulty in processing the printed text. Assistive technology, including music notation and sequencing software may prove to be an invaluable classroom resource.¹¹⁶ Using any kind of kinesthetic or multisensory learning tool in the classroom will help to solidify note reading concepts that would otherwise be lost in a typical classroom setting. Finger tracking is an easy multisensory exercise for note reading assistance. The student reads the symbols on the page while naming notes out loud and physically following the music with the first finger. This process has been proven to assist with letter migration (letter rearranging inside a word) in students with ADHD/dyslexia, and can easily translate to music reading, as well.¹¹⁷

Japanese violinist, Shinichi Suzuki, developed a style of music learning over half a century ago that applies, “the principles of language acquisition to the learning of music, and called his method the mother-tongue approach. The ideas of parent responsibility, loving

¹¹⁵ Oglethorpe, *Instrumental Music for Dyslexics*, 45-71.

¹¹⁶ McCord and Watts, “Collaboration and Access for Our Children,” 26-33.

¹¹⁷ Naama Friedmann and Einav Rahamim, “What Can Reduce Letter Migrations in Letter Position Dyslexia,” *Journal of Research in Reading* 37, no. 3 (2014): 297.

encouragement, constant repetition, etc., are some of the special features of the Suzuki approach.”¹¹⁸ Cambridge Suzuki piano teacher and trainer, Jenny Macmillan, received her degree in Psychology for Musicians from Sheffield University and currently lectures throughout the United Kingdom, while contributing to several music education journals. She believes that the Suzuki approach addresses a number of the challenges that students with dyslexia will face when learning a musical instrument:

Teaching programmes for people with dyslexia need to be structured, sequential, cumulative, thorough and multisensory. Plenty of listening to music, repetition of assignments, participating in group lessons, learning initially by ear and activities aimed at building pupils’ self-confidence are recommended. The Suzuki programme covers all these issues.¹¹⁹

While the Suzuki approach in its entirety may not work in the middle school classroom, several important aspects can easily be applied and can benefit the whole class:

- A structured approach with repetition—always repeat and build upon previous skills before learning new ones.
- Consistent, sincere praise—“Suzuki teachers are trained to be very positive in their teaching and always find something to praise before suggesting some aspect for improvement.”¹²⁰
- Thorough preparation for all beginner performances in order to build self-confidence and good experiences.
- Listening to music everyday.
- Parental support, even when parents have little or no musical experience.

¹¹⁸ Suzuki Association of the Americas, “About the Suzuki Method,” accessed February 14, 2016, <https://suzukiassociation.org/about/suzuki-method/>.

¹¹⁹ Jenny Macmillan, “Suzuki Benefits for Children with Dyslexia,” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 137.

¹²⁰ *Ibid.*, 140.

- Breaking down the multitasking. Focus on aural and technical skills separately from the notation before integrating all three.¹²¹

Most importantly, it is helpful for teachers of beginner students to teach to the students' strengths and to be flexible and experimental in their note reading approach from year to year.

4.4 Rhythmic Mimicry and Pitch Recognition

Not all musical traits in the student with ADHD/dyslexia will be prohibitive. Because of the enlarged portions of the right hemisphere in the ADHD/dyslexic brain, it is likely that a student with ADHD/dyslexia will have a good recognition of when pitches sound correct or incorrect.¹²² Students may memorize entire passages or pieces by ear and can figure out technical aspects of the piece through rote learning. A teacher should be particularly cognizant of the excellent memory in students with ADHD/dyslexia, as they could “trick” a teacher into thinking they are progressing, when they are actually just memorizing and mimicking extremely well. Liz Dunoon cautions,

Remember that children can be incredibly good at disguising a learning disability. They do this in order to fit in, be accepted and in an attempt to keep up with their classmates, while keeping their parents happy. It is generally not their intention to mislead their teachers or parents, however children develop ways to survive in the classroom and this may lead them to develop strategies to cover up their learning problems. A conscientious teacher may pick up on this, but many may not.¹²³

¹²¹ Ibid., 140-141.

¹²² Germanò, Gagliano, and Curatolo, “Comorbidity of ADHD and Dyslexia,” 479; Katie Overy, et al., “Dyslexia and Music: Measuring Musical Timing Skills,” 33.

¹²³ Dunoon, *Helping Children with Dyslexia*, 123.

Music teachers should ask themselves the following questions:

- 1.) Do the students' eyes physically scroll in time with the music? Do their eyes jump to the next line appropriately or do they seem to stare "through the page" as they play?
- 2.) Is the student playing a rhythm that is not in the passage because it has been simplified in print but it exists in the original part (an indication of playing by ear)?
- 3.) Does the student play the correct notes and fingerings because the teacher has just called out the letter names and fingerings and the student has memorized them upon an initial hearing?

These questions are vital to the identification of the true amount of learning that is taking place versus memorization of a particular piece. While memorization is impressive, it will not help the student to sight-read or learn a new piece.

Students with ADHD/dyslexia are adept at figuring out the correct answer but in a very indirect manner.¹²⁴ Because they often end up with the correct result, students with ADHD/dyslexia can get beyond the graded material without learning the "correct way" or process of arriving at the answer, just like students that can correctly solve an algebraic equation, but are incapable of showing their work to the teacher. In music, the final product is extremely important, but the process may be more so. If the student fails to understand the process, neuronal connections will be lost and it may be exasperating to learn more difficult music in future years. Unfortunately, this frustration leads some students to quit their musical studies prematurely. Remediation of any incorrect techniques must be addressed in the

¹²⁴ Ogelthorpe, *Instrumental Music for Dyslexics*, 8.

formative years so that the student's musical growth will not be negatively impacted in the long term.

4.5 Posture and Gross Motor Coordination Deficits

One of the greatest sources of frustration for the teacher and for the learner with ADHD/dyslexia (especially those with dyspraxia or executive functioning issues) is proper carry and correct posture while playing an instrument. Correct posture is crucial for good tone development, which includes proper breathing, and for the prevention of repetitive injuries (e.g., carpal tunnel syndrome, tendonitis). The vestibular mechanism, a cove in the inner ear, serves as the body's "bubble balance," sending signals to the brain when the body is out of balance (poor posture). The brain then reacts to this input by tightening muscles to correct the balance, thereby adding extra muscle contraction that goes beyond the contraction needed to perform on an instrument. Poor posture can lead to chronic back pain, which can eventually become debilitating. Dr. Elena Gabor, Associate Professor at Bradley University, Illinois says, "Contracting more muscles than necessary and tensing the body for long periods of time during performance can negatively impact the musician's sound. Pianist Greg Kostraba remembered that a college mentor showed him that the tremor in his left foot was not caused by nerves, but by improper distance from the piano, and that tensed shoulders affected his sound."¹²⁵ Improper posture and balance can cause needless muscle tension and pain, which could lead to further body contortions, poor tone quality, and poor gross motor control, and therefore, fine

¹²⁵ Elena Gabor, "'Tuning' the Body of the Classical Musician: an Embodied Approach to Vocational Anticipatory Socialization," *Qualitative Research in Organizations and Management: An International Journal* 8, no. 3 (2013): 215.

motor control. The discomfort and lack of good tone and technique could then lead to a lack of motivation to practice and improve.

Complicating the matter further is the likelihood that a beginner musician in Texas public school will be pre-pubescent, which could impact his or her ability to properly hold an adult-sized instrument while sitting in an adult-sized chair. Sheila Oglethorpe warns, "If the 'normal' child has to be reminded to sit properly, how much more the dyslexic? Because he may find it exceptionally difficult to concentrate both on what he is trying to play and on how he is sitting, one has to be careful not to nag. It can be helpful to have a discussion with him about how the problem can be solved."¹²⁶ She also says,

The dyslexic sometimes finds it very hard to sit still. One hypothesis is that it is because a small area in the brain that is responsible for the control of the reflexes has not, in dyslexics, been fully developed. If they are told to sit still, they will be able to do so only at the expense of something else. Sitting still will, for them, involve concentration.¹²⁷

Some beginners may feel more comfortable standing while playing or sitting cross-legged on the floor, which will in turn keep their fidgeting to a minimum.

The highly structured Suzuki approach, which begins when a child is three or four years old when their aural and motor skills are fully developed, is an effective method for helping students with ADHD/dyslexia to understand and practice the importance of proper posture.¹²⁸ Suzuki teachers emphatically stress this importance from the very first lesson and even before the first lesson as potential new students observe older students' lessons; parents take on a vital role in making sure that the student follows all teacher recommendations. Teachers make

¹²⁶ Ogelthorpe, *Instrumental Music for Dyslexics*, 73.

¹²⁷ Ibid.

¹²⁸ Macmillan, "Suzuki Benefits for Children with Dyslexia," in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 138.

sure that beginners start on appropriately sized, smaller instruments and that students have adjustable stools and/or footstools so that they can sit comfortably while firmly planting their feet while playing.¹²⁹ Students are asked to watch and listen to their teachers perform while being aware of every technical movement on the instrument. Teachers may invite students to feel these gross motor movements by resting a hand on the teacher's arm and going through the motions as the teacher plays.¹³⁰ A modified Suzuki approach to posture could be helpful in the beginning band classroom—appropriately sized seats and instruments could prove useful. Both teacher and model student demonstrations of proper posture will help the student with ADHD/dyslexia observe and achieve what they see, while maintaining a positive classroom atmosphere.

It is essential for teachers to always model correct posture. Discrepancies between a teacher's modeling and aural or written expectations confuse students with executive functioning deficiencies, which could lead to inappropriate questioning and classroom disorder. While the use of mirrors is essential in beginning classrooms, pictures of other beginners or professionals with proper posture can prove to be invaluable resources. It could be helpful to post these pictures on a board in the band hall, put them on a mobile device where they could be easily accessed, or clip them to a music stand. Students with ADHD/dyslexia thrive upon positive reinforcement, as they are overly eager to please their teachers and fit into social situations.¹³¹ If a student with ADHD/dyslexia hears another student being praised for excellent posture, he or she will tend to follow suit.

¹²⁹ Ibid.

¹³⁰ Ibid, 139.

¹³¹ Carl Swanson, "Students with ADHD," *Journal of Singing* 64, no. 2 (November-December 2007): 218.

Posture involves gross motor control:

Dyspraxia can also affect gross motor coordination skills (large movements), such as 'balance, posture, and [the] integration of contralateral body movements', muscle fatigue, hand-eye co-ordination, sense of rhythm, ability to change direction and stop and start movement and a tendency to trip or fall' as well as a 'lack of spatial awareness' within the broader area of perception.¹³²

Gross motor control issues, which are symptoms of both dyslexia and ADHD, can manifest in the music classroom in the following ways: 1. body awareness (posture) 2. balance, 3. coordination of major muscle groups (important for marching and clapping/tapping), 4. laterality (awareness of left and right sides of the body), 5. crossing of the midline (important for keyboard, string, and percussion playing), and 6. spatial orientation of the body in relation to other objects and people.¹³³

People with dyslexia in particular,

have been shown to have difficulty with static and dynamic balance, ball skills, manual dexterity, gross and fine motor skills and the production of simultaneous movements. Additionally, there is evidence for a deficit in the motor skills required in speed of tapping, heel-toe placement, rapid successive finger opposition, and accuracy in copying... everyone of these skills is required at some level to play a musical instrument... physical movements should be broken down into the simplest units possible. There are students with dyslexia who have trouble sitting still; adding breathing, embouchure formation, tonguing, fingering, toe tapping, and reading in an instrumental music class creates an almost impossible situation.¹³⁴

In their case study concerning developmental delays in children with ADHD, Drs. Dyck and Piek found that on a test of gross-motor coordination skills, independent from any

¹³² Sally Daunt, "Chapter 7: Dance: an Overview" in *Music, Other Performing Arts and Dyslexia*, ed. Sally Daunt, (Oxford: British Dyslexia Association, 2012), 108.

¹³³ Kate O'Brien Vance, "Adapting Music Instruction for Students with Dyslexia," *Music Educators Journal* 90, no. 5 (2004): 30; Dyck and Piek, "Developmental Delays in Children with ADHD," 474; Ogelthorpe, *Instrumental Music for Dyslexics*, 5-6.

¹³⁴ Vance, "Adapting Music Instruction for Students with Dyslexia," 30.

language based skills, 37% scored below the 15th percentile in gross motor tests.¹³⁵ “There is accumulating evidence that motor skills problems are associated with impaired attention and executive functions and that motor skills disorder and ADHD have a shared etiology.”¹³⁶ It is therefore important to be aware of gross motor skills issues in students with ADHD/dyslexia.

In the music classroom, posture and gross motor control problems should be dealt with systematically, slowly, and with a variety of multisensory techniques and games.¹³⁷ Problems with posture and gross motor coordination should be addressed because they can lead to problems with the fine motor skills necessary to play an instrument.

4.6 Fingering Difficulties and Small Motor Coordination Deficits

When beginning to instruct students on which keys to press or strings to pluck, a student with ADHD/dyslexia may not process the information in a manner that can be replicated quickly. For the student with motor control difficulties, rapid successive ordering of fingerings in a passage may prove difficult, cumbersome, or labored. When multiple fingerings can be used for single notes or when different octaves of the same letter have different fingerings, the student with ADHD/dyslexia might conflate those fingerings. Sheila Ogelthorpe says,

If you ask a dyslexic first to put his hand behind his back and then to tell you which of his fingers you touch, it would not be uncommon to find that he is unable to do so with any conviction. Many can, proving that messages from the finger to the brain are correct, but even these dyslexics frequently have more difficulty with sending messages from the brain to the correct finger than does the non-dyslexic.¹³⁸

¹³⁵ Dyck and Piek, “Developmental Delays in Children with ADHD,” 474.

¹³⁶ Ibid.

¹³⁷ Ogelthorpe, *Instrumental Music for Dyslexics*, 72-76; Vance, “Adapting Music Instruction for Students with Dyslexia,” 30.

¹³⁸ Ogelthorpe, *Instrumental Music for Dyslexics*, 85.

It is not uncommon for people with dyslexia to confuse their left and right hands. They may confuse or flip the numbers (1-5) commonly used to describe each finger, especially in piano, string, and woodwind playing. It may be much quicker and easier for a teacher to simply point to “that hand” or “that finger” instead of calling out “left hand” or a number for a finger. If the student can see his hands while playing an instrument (piano, left hand of the violin, etc.) it may be helpful to write the numbers on the fingers with a soft, washable pen.¹³⁹

Because learners with ADHD/dyslexia are concrete in their process, a slow, deliberate educational speed is required.¹⁴⁰ Having to unlearn or re-teach a fingering to student with ADHD/dyslexia will induce a high level of frustration. Using different methods to teach fingerings will assist in recalling the information when needed: stories for unusual fingerings, funny anecdotes for repetitive fingerings, putting color-coded stickers on instrument keys that belong to the same finger, etc. It may be helpful to play along with the student in the correct octave on their instrument or on a keyboard. Using different rhythms for fingering passages can help solidify difficult patterns while keeping the music interesting to the inattentive student. Utilizing as many multisensory techniques as possible will speed up the learning process.¹⁴¹

Small or fine motor coordination involves finger dexterity. Students with ADHD/dyslexia may have trouble with tricky fingering passages, especially those that use cross fingerings (picking up and putting fingers down at the same time when changing notes.) A common sign of poor small motor coordination in students with dyslexia is untidy handwriting and a tight,

¹³⁹ Ibid.

¹⁴⁰ Bryson, “Teaching a Student with Dyslexia,” 431.

¹⁴¹ Ogelthorpe, *Instrumental Music for Dyslexics: 12-13*.

awkward pencil grip.¹⁴² In computerized studies measuring finger dexterity and reaction times, children with ADHD diagnoses have generated abnormally slow and variable reaction times, possibly due to a combination of lapses in attention as well as impairments in motor control.¹⁴³ “Reaction times—the intervals between a particular external stimulus and a response—are at the most basic level an indicator of the processing speed of the nervous system... In children with ADHD, the development of motor control, including speed and timing, balance, and suppression of contralateral overflow movements, lags compared to TD [typically developing] children.”¹⁴⁴

In spite of hours of practice, students with ADHD/dyslexia may sound as if they have not been practicing enough; they may have attempted to learn the passage too fast or failed to properly break down the passage into smaller chunks before speeding up the tempo.¹⁴⁵ It would be helpful for a teacher to instruct students to practice difficult finger patterns slowly and methodically with careful attention to metronome markings, or to manipulate a passage in variety of ways (play it backwards, use the other hand on one-handed instruments, start at the highest note of the scale first, working backwards before playing the written pattern.) Dyslexia expert, Shiela Ogelthorpe, suggests practicing fingerings without an instrument (practicing piano fingerings on a table or woodwind fingerings on a pencil) and to allow enough time and breaks with changes of scenery in order for the brain to process the information and create new neuronal pathways.¹⁴⁶ The more avenues of approaching the process of learning a new

¹⁴² Ibid., 77.

¹⁴³ Jenna M. Klotz, et al., “Relationship Between Reaction Time Variability and Motor Skill Development in ADHD,” *Child Neuropsychology* 18, no. 6 (November 2012): 576.

¹⁴⁴ Ibid., 577.

¹⁴⁵ Swanson, “Students with ADHD,” 219.

¹⁴⁶ Ogelthorpe, *Instrumental Music for Dyslexics*, 77.

fingering passage, the better and more likely the student with ADHD/dyslexia will be to committing the information to long-term memory.

4.7 Learning Speed

It can be difficult to properly pace the delivery of new information in a classroom environment. A teacher must balance the ability to challenge and motivate quick learners without frustrating or leaving behind slower students, all while adhering to state and federal regulations. Because the student with ADHD/dyslexia can be easily distracted and/or frustrated by the material presented, it is essential to quickly identify the areas of success and weakness and adapt the lesson plan to best serve the entire class. Lesson plans might need to be altered slightly from year to year. In spite of the difficulties in the learning process, a student with ADHD/dyslexia can and will master the skills presented to them, given time and sufficient multisensory and multimodal explanation. T.R. Miles says,

In all cases learning the name of the symbol is possible for dyslexics, but it may take them more time and effort than it takes their non-dyslexic peers: the names may take longer to sink in and become associated with their meaning, and may also be more easily forgotten. Once, however, the names have been learnt, dyslexics are no worse than non-dyslexics at applying what they know.¹⁴⁷

It is important not to dwell on the failures of the student but to enthusiastically continue moving at a slow, consistent pace. Providing incomplete information (because a teacher feels that a student “cannot handle advanced concepts yet”) or glossing over important details (in order to come back to them later) will only confuse and frustrate the learner with ADHD/dyslexia, who strives to understand the bigger picture. Frustration can mount,

¹⁴⁷ Tim Miles, “Parallels Between the Teaching of Musical and Mathematical Notation,” in *Music and Dyslexia in Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 69-70.

particularly if teachers provide contradictory information later in the student's development. It could be more helpful to acknowledge a hole in the concept and say when it will be addressed in the future; i.e., this high note is tricky because of its fingering/air speed/poor intonation, so we will work on the intonation after we have learned all of the notes on the fingering chart. In addition, "repetition is key. Teach the student to review skills, concepts, or challenging parts a few more times than he or she might want to."¹⁴⁸ For the learner with ADHD/dyslexia, skills and knowledge are easiest trained and learned correctly from day one. Speed and quantity of material might need to be sacrificed in order to build an accurate, strong foundation.

4.8 Anxiety in Solo Performance and Graded Playing Tests

No musical trait can be more destructive to the young musician than extreme anxiety. While neurotypical students suffer with anxiety, the severity is magnified further in the student with ADHD/dyslexia because of an innate desire to please and succeed.¹⁴⁹ In spite of the student's outward appearance or behavior, he or she is hyper-aware of the social and academic implications of various situations in the classroom. If students with ADHD/dyslexia are asked to perform individually in front of their peers, whether they are doing well or not, they will undoubtedly become anxious. The anxiety could manifest from unreasonable fear of failure or looking dumb in front of their peers. Students with ADHD, in particular, are predisposed to higher levels of anxiety: "It could be the case that a high-stakes test situation exacerbates

¹⁴⁸ Vance, "Adapting Music Instruction for Students with Dyslexia," 29.

¹⁴⁹ Swanson, "Students with ADHD," 218.

anxiety for these individuals.”¹⁵⁰ In students with dyslexia, test anxiety can overwhelm a student’s performance on skills-based assessments:

...students with intellectual disabilities experienced test anxiety and unnecessarily worried and feared before submitting an assignment. They displayed all kinds of bodily fearful symptoms before the performance of a task. This was mainly due to their intellectual impairment that they perceived failure too often and too easily. One of the teachers suggested that constant practice and over learning any new skill/task for the students with intellectual disabilities to the extent that they can perform it without much effort to the best of their abilities and only then they should be put to testing that new skill/task.¹⁵¹

Easing a student into solo performance will be beneficial. Holding private playing opportunities for the teacher, using a private space for test taking, giving extra time to finish or play again, and holding off on providing judgment until after the class is excused can all lead to a better, overall positive experience for the student and hopefully decrease anxiety for future performances. Music educators should review federal privacy laws (FERPA) before calling grades out loud in class. Having the option to grade playing tests on an individual, private basis, could free the student with ADHD/dyslexia to happily perform in front of others without the added pressure of a high-stakes grade. We music teachers want to rear students to be completely comfortable and enjoy playing for others; reducing their anxiety and providing specific praise could be all the encouragement necessary.

As students with ADHD/dyslexia thrive upon positive reinforcement, it is important to consistently praise good behavior and achievement of short-term goals:

Students will also benefit from knowing what the expected ‘reward’ is for successfully meeting those expectations. This reward might be rather concrete for young students:

¹⁵⁰ Lawrence Lewandowski, et al., “Test-Taking Skills in College Students With and Without ADHD,” *Journal of Psychoeducational Assessment* 31, no. 1 (2013): 42.

¹⁵¹ Poulomee Datta, “Is Test Anxiety a Peril for Students with Intellectual Disabilities?” *Journal of Intellectual Disabilities* 17, no. 2 (June 2013): 130.

gold stars, stickers, or erasers shaped like G-clefs. Or it might be more abstract for older students who have learned to better manage their ADHD [and dyslexia]: the chance to spend a few minutes working on a section of that favorite aria that he or she has always wanted to sing.¹⁵²

Effectively timed, specific praise is important for quelling fear and self-doubt in the student with ADHD/dyslexia and for motivating them to continue on the correct path of learning. As they typically receive very little praise in other school subjects, a little bit of positive reinforcement can have a magnifying effect in the music classroom.

4.9 Attention, Hyperactivity, Impulsivity, and Executive Functioning Deficits

Students with ADHD/dyslexia could prove to have non-musical related problems that affect the learning of music in the classroom. Symptoms of inattention in the music classroom include daydreaming, extreme distractibility, difficulty refocusing after an interruption (if someone drops a pencil across the room), becoming bored quickly, difficulty focusing on one task, missing details, forgetting materials, difficulty processing information quickly and accurately, or struggling to follow directions. Careful classroom seating and environmental controls are helpful considerations to be made with students with inattention. Dr. Kathleen Melago, flutist and Assistant Professor of Music Education at Slippery Rock University in Pennsylvania, suggests, “Teachers should look for ways to make the teaching space as conducive to learning as possible and to do their best to eliminate distractions.” Such

¹⁵² Ibid.

distractions include ticking clocks, ringing cell phones, flashing lights, elaborate classroom decorations, stimuli from outside a window, fragrances from food or perfume, and visitors.¹⁵³

Symptoms of hyperactivity in the music classroom could include fidgeting or squirming, non-stop talking, touching or playing with anything in sight (such as percussion equipment, music stands, clicking pencils), having difficulty sitting quietly, blowing into or playing an instrument without invitation, among others. Symptoms of impulsivity include blurting out answers, being impatient and demanding out-loud to know what activity comes next, difficulty waiting their turn to demonstrate on their instrument, or interrupting the teacher or other students in the middle of a lesson in order to interject a personal story or ask a question. A possible accommodation for the restlessness in the classroom could be to get a set of fidget toys or to strap exercise bands to the legs of the chairs. The student with ADHD/dyslexia does not mean to be rude or distracting—they simply need stimulation in order to concentrate:

Remember that while this behavior may have been distracting to the teacher, the student's need for optimizing stimulation actually may be being fulfilled through this behavior. Indeed, this behavior actually may be responsible for the successful completion of the educational goal being attempted at that time, as it is working to allow the student to remain focused on the goal at hand.¹⁵⁴

Executive functioning difficulties could cause students with ADHD/dyslexia to forget their instrument, music, pencil, or any other related device needed to learn their instrument. For that student, having two copies of all needed supplementary material, one for school and one for home, can aid in solving this problem. As well, these students need organization and specific directions in order to be able to practice effectively. They need step-by-step

¹⁵³ Kathleen A. Melago, "Strategies for Successfully Teaching Students with ADD or ADHD in Instrumental Lessons," *Music Educator's Journal* 102, no. 2 (December 2014): 38.

¹⁵⁴ Swanson, "Students with ADHD," 218.

instructions on how to practice, what to practice, and how long to practice. Breaking up practice sessions into small, manageable parts is also helpful: e.g., five minutes on tone, five minutes on the C-scale, break, and ten minutes on a solo.¹⁵⁵ This way, the student with ADHD/dyslexia can approach practicing in a concrete, structured manner, as opposed to “take out your instrument and play for 30 minutes.” In addition to breaking down practice sessions into small categories or intervals, practice material within those categories can also be segmented in order to achieve short-term goals: “... students with ADHD [and dyslexia] do better when presented with more short term goals than long term goals. Most students do better when we break down information into smaller segments, called “chunking” by psychologists, and this is especially true for students with ADHD [and dyslexia]. For these students it would be wise to learn pieces in smaller units.”¹⁵⁶

Because some ADHD students will be receiving medical intervention as a supportive service, understanding the time frame when the student learns best can prove beneficial in the classroom.¹⁵⁷ Having an ADHD student in the last period of the day when medicinal effects may be wearing off may not be as successful as teaching him or her during first period when the medicine is in full effect. Possibly changing the schedule of the ADHD beginners, in lieu of instrument specific placement, may yield a better result. In a private setting with these students, the teacher should be aware of the pace of the lesson and keep it varied, with little down time. The constant movement from one task to another helps some students to stay

¹⁵⁵ Melago, “Strategies for Successfully Teaching Students with ADD,” 41.

¹⁵⁶ Swanson, “Students with ADHD,” 219.

¹⁵⁷ National Institute of Mental Health, “Attention Deficit Hyperactivity Disorder”; Melago, “Strategies for Successfully Teaching Students with ADD,” 42.

focused.¹⁵⁸ It is important for educators to understand that, while medical interventions for the treatment of ADHD are helpful, they do not address all of the needs of the student: “Although stimulant medication frequently is used to reduce ADHD symptoms, pharmacological treatment rarely is sufficient in addressing the multiple, chronic difficulties faced by students with ADHD.”¹⁵⁹

4.10 Sight-Reading

Successful sight-reading—the ability to accurately perform a piece of music that the performer has never seen—requires the simultaneous execution of a number of refined skills: note reading, rhythm recognition, consistent pulse, small and large motor coordination, sustained attention, and symbol decoding.¹⁶⁰ While these musical traits can cause great difficulty for the musician with ADHD/dyslexia, students can practice and improve the skills independently by using the aforementioned remediation techniques. However, when attempting to multitask during sight-reading, students with ADHD/dyslexia could become overwhelmed, performing poorly compared to their neurotypical peers.¹⁶¹

The added pressure of sight-reading as an evaluation method will cause a high level of anxiety for the student with ADHD/dyslexia, inaccurately portraying the student’s progress and level of achievement on his or her instrument. The London College of Music recognizes the special needs of certain students and allows some flexibility in their testing procedures: “The chief examiner considers the needs of candidates on a case-by-case basis, and all appropriate

¹⁵⁸ Ibid.; Swanson, “Students with ADHD,” 219.

¹⁵⁹ DuPaul, “ADHD in the Classroom,” 36.

¹⁶⁰ Reinhard Kopiez and Ji In Lee, “Towards a General Model of Skills Involved in Sight Reading Music,” *Music Education Research* 10, no. 1 (March 2008): 41-42.

¹⁶¹ Dyck and Piek, “Developmental Delays in Children with ADHD,” 475-476.

and reasonable steps are taken to ensure that any special requirements which they may have are put into place, while at the same time maintaining the full rigour of the examination itself.”¹⁶² One accommodation allows for a memory test to replace the sight-reading component in exams.¹⁶³ Trinity College London also allows accommodations for the special needs of their test-takers: enlarged print that approximately doubles the size of standard notation (candidates may send in samples of their preferred size), enlarged tests on low contrast pink paper or another color of the candidate’s choosing (candidates may provide samples of their preferred color), extra time allowance starting at an extra 90 seconds for the first three grade levels and increasing up to two and a half minutes for more advanced tests, or a choice of two components—sight-reading, aural, improvisation, or musical knowledge—for the first five grade levels of testing.¹⁶⁴

It would benefit students with ADHD/dyslexia to learn new sight-reading techniques slowly and methodically.¹⁶⁵ The student should demonstrate a command of each of the musical facets needed to sight-read (understanding of key and time signatures, foreign terms, advanced recognition and decoding of musical symbols, internalization of pulse, and strong instrument fundamentals including knowledge of fingerings, mechanics, correct posture, and good use of air for wind instruments) before attempting to combine the techniques. Since students with ADHD/dyslexia have deficits related to time, pulse, and rhythmic decoding, sight-reading rhythms should be simple and performed at slow tempo, below 80 beats per minute (bpm), in

¹⁶² Daunt, “Chapter 10: Reasonable Adjustments in Performing Arts Examinations,” in *Music, Other Performing Arts and Dyslexia*, ed. Sally Daunt, 140.

¹⁶³ Ibid.

¹⁶⁴ Trinity College London, “Music Special Needs,” accessed March 16, 2016, <http://www.trinitycollege.com/site/?id=2960>.

¹⁶⁵ Bryson, “Teaching a Student with Dyslexia,” 431.

order to give the student their best chance at success.¹⁶⁶ Each successive sight-reading example should progress slowly and include only one additional, slightly more difficult aspect of musical notation at a time (e.g., easy key with no accidentals but an added dotted rhythm, only whole, half, and quarter note rhythm with an advanced key).

The following tips could help lessen the frustration of sight-reading for learners with ADHD/dyslexia:

- Practice sight-reading with teacher-guided commentary on a consistent basis in order to help a student organize his or her thoughts, formulate a plan, and feel confident executing that plan.
- Have copies of music with a large, clear font printed on colored paper or black and white paper with a colored overlay may help with visual processing inconsistencies or slow processing speeds.
- Provide the student with sight-reading examples at one or two levels below his or her sight-reading potential during high-pressure situations.
- Allow for more than the typical 30 seconds to look over a sight-reading exercise before testing in order to boost confidence and detract from the anxiety of being rushed. For those students with poor short-term memory, however, the extra time may actually be counter-productive; the mental preparation involved in noting key signatures, accidentals, etc. will be immediately forgotten, and the student would be better served by simply practicing more examples.¹⁶⁷

¹⁶⁶ Overy, "Dyslexia and Music: from Timing Deficits to Musical Intervention," 499, 501, 503.

¹⁶⁷ Sheila Oglethorpe, "Sight-reading," in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 83.

- Allow the student to clap or tap the rhythms out loud. Ask the student to physically follow the music with their finger.
- Use duets with familiar tunes as sight-reading practice, which can encourage the student with ADHD/dyslexia to want to practice sight-reading, promote the use of dynamics and style, lend confidence to tricky rhythms, lessen overall anxiety, and strengthen the teacher-student bond.¹⁶⁸
- Finally, allow students to perform sight-reading exams in private, which will greatly diminish anxiety related to sight-reading and test-taking in general.¹⁶⁹

¹⁶⁸ Oglethorpe, *Instrumental Music for Dyslexics*, 121.

¹⁶⁹ Abiola Alao, "Educational Accommodations for College Students with ADHD," *The Brown University Child and Adolescent Behavioral Letter* 31, no. 3 (March 2015): 1-2; Datta, "Is Test Anxiety a Peril," 130; Texas Education Agency, *The Dyslexia Handbook*, 56-57.

CHAPTER 5

MY PERSONAL JOURNEY WITH ADHD AND DYSLEXIA

5.1 Introduction

As a person with comorbid ADHD and mild-to-moderate dyslexia, I experience a range of symptoms related to the conditions on a daily basis: phonological processing deficit, dysphasia, dysgraphia, dyspraxia, executive functioning deficits, visual processing deficits, hyperactivity, impulsivity, and inattention. These genetic traits have shaped my growth as a person and musician and continue to affect my life. The difficulties I have faced as a music student and professional horn player have become clearer to me after receiving a diagnosis for ADHD at age 14, and a belated diagnosis for dyslexia at age 33. Sharing this story will hopefully help raise an awareness of the importance of identifying and remediating others, like myself, so that they can have the best chance of succeeding in music and other aspects of their lives.

5.2 Family History

Because there is a genetic component related to the development of ADHD/dyslexia, a thorough discussion into the background of my family's genetic history is helpful towards understanding my conditions. The following list consists primarily of the paternal side of my family tree. The maternal history is unknown, as my mother was adopted as an infant. She has never been tested for dyslexia, but suspects that she has phonological processing deficits.

Family Member	Conditions
Grandfather	Suspected ADHD/dyslexia
Grandmother	Suspected ADHD
Father	Diagnosed ADHD, executive function deficit, suspected dysgraphia, and visual processing problems
Aunt	Diagnosed ADHD, suspected dyscalculia, and auditory processing problems
Brother #1	Diagnosed ADHD
Brother #2	Diagnosed ADHD, suspected dyscalculia, dysgraphia, and dyspraxia
Cousin #1	Diagnosed ADHD
Cousin #2	Diagnosed ADHD
Cousin #3	Diagnosed ADHD

In addition to ADHD/dyslexia, I, along with majority of my family, have a congenital eye anomaly called Blepharophimosis-Ptosis-Epicanthus Inversus Syndrome (BPES), which means that I was born without the palpebral muscle needed to raise my eyelids. I have had corrective surgery twice, at ages one and four. The surgery involved the trans-nasal wiring of my canthal tendons and the shortening of my eyelids to correct my vision impairment. To my knowledge, no one has formally researched the link between my eye condition and its relationship to ADHD/dyslexia. However, there have been studies linking BPES and certain developmental delays.¹⁷⁰ The pedigree of my family's eye anomaly was established when my father underwent corrective eye surgery at age five. His surgery was reported in the *Journal of the International College of Surgeons*.¹⁷¹

¹⁷⁰ Anthony Tyers, "Blepharophimosis-Ptosis-Epicanthus Inversus Syndrome (BPES)," *Orbit* 30, no. 5 (October 2011): 199-201.

¹⁷¹ Neal Owens, R.C. Hadley, and H.W. Kloefer, "Hereditary Blepharophimosis, Ptosis, and Epicanthus Inversus," *Journal of the International College of Surgeons* 33, no. 5 (May 1960): 558-573.



Benjamin Raviotta, age 1 before surgery

Additionally, I had several recurring and severe ear infections throughout my infancy into early childhood, which may have been a compounding factor during my development. At age one, pressure equalization tubes were surgically inserted into my ears to drain fluid through my nose. While somewhat managing my ear infections, possible language development issues may have occurred due to the abundance of ear infections.

5.3 Early Childhood Education

Growing up in New Orleans, Louisiana, with its rich musical heritage, I had an incredible, culturally enhanced childhood. I discovered a love for music at a very young age. During my early childhood, my father, an obstetrician, performed in the clarinet section of the New Orleans Concert Band for recreation. I would attend most of my father's band concerts, including the Fourth of July event in Jackson Square and the Christmas concert. I loved listening

to the different timbres of the instruments and the high level of music performance. I remember looking forward to the encores at each concert because they would always play *Stars and Stripes Forever*. I rode home singing and whistling the tune every time.

Being from New Orleans, I attended numerous Mardi Gras parades. While most people were there to enjoy the overall festivities, catch beads and doubloons, and see the beautiful floats, I was there to hear and see the marching bands perform. My dad played recordings of Dixieland jazz in the car and at home, which reinforced my desire for music to be a part of my life. My parents took note of my interest in music and my aptitude and curiosity for all things related to math, science, and music. Thus, they enrolled me in various music classes. One, in particular, had a significant influence on me. My mother located an early childhood music education teacher, “Mrs. H.,” who taught music appreciation to young children in her home. So at ages four through eight, I went to her home after school on Tuesdays and Thursdays for an hour and a half. She gave us an overview of music history and taught us about the composers. Mrs. H. held my interest because she understood the needs of young children and varied the activities. She always played background music of the period we were studying while we did arts and crafts.

She created funny poems to help us remember famous tunes.



Word rhythms to *Eine Kleine Nachtmusik* by W.A. Mozart¹⁷²

¹⁷² Wolfgang Amadeus Mozart, *Eine Kleine Nachtmusik*, K.525, score, 1787, International Music Score Library Project, Petrucci Music Library, accessed September 25, 2016, [http://imslp.org/wiki/Eine_kleine_Nachtmusik,_K.525_\(Mozart,_Wolfgang_Amadeus\)](http://imslp.org/wiki/Eine_kleine_Nachtmusik,_K.525_(Mozart,_Wolfgang_Amadeus)).

During this time, my parents gave me some classical music on cassette tapes, and I often played those at bedtime to remind me of the invaluable experience I had with Mrs. H. My parents also enrolled me in piano lessons and voice instruction at age four. While I took to voice quite easily, piano seemed impossible. I recall my first teacher hitting my right hand with a ruler because I could not roll my thumb under my first two fingers in order to properly finger an ascending scale. I practiced diligently, but my fingers did not do what I knew they were supposed to do. I used one finger on each hand to dabble little tunes from my memory or combine sounds that I thought were interesting, but I could never coordinate the movements of both hands into a successful piano technique. After my failures with this first teacher, my parents located a more patient piano teacher that could cultivate my love of singing and music while not pushing me to become a world-class pianist.

My parents, who were enthusiastic advocates of my education, enrolled me at Eisenhower Elementary School in Orleans Parish at age four. Prior to my enrollment in preschool, my parents joined the Parents Association of Gifted and Talented Students because both of my brothers tested successfully into the gifted and talented (GT) program at Eisenhower Elementary. Additionally, my mother served as president of the PTA at the school. With my parents' understanding of the GT program in Orleans Parish and my mother's position in the PTA, they were able to address certain elements within the GT program. After successful installation of some changes, my parents submitted an application. They had me evaluated by a private psychologist. He followed the protocol, per the entry requirements of the program, by administering an IQ test and other standard early testing methods for GT. The psychologist

recommended my acceptance into the GT preschool program. My GT preschool education became the most important part and foundation of my education.

I met “Mrs. B.” when I entered preschool. She was my preschool and Kindergarten GT teacher and choir director for seven years. Even though my GT evaluation showed a deficit in language-based skills, I was not formally diagnosed with a learning disability. My scores were in the highest percentiles in math and science. The testing concluded that I should concentrate on the fields related to math, science, and music. English however, would become my greatest nemesis in school. Fortunately, being in Mrs. B.’s class, I was in the hands of a child education and GT specialist who taught us how to read using phonological, phonemic awareness. To this day, I can vividly remember her room. Attached to the ceiling and encircling her classroom, were large, yellow, laminated note cards with all of the phonemes in the English language. Due to this early, specialized education, I believe my phonological processing deficits were mostly remediated. Mrs. B. became a source of inspiration and love in both school and choir. As I was always the “star” singer in the choir, I had numerous solos throughout my time at Eisenhower. My new piano teacher reinforced my music education. We spent 15 minutes of my lesson doing piano technique and then 15 minutes singing show tunes while she accompanied me. She both recognized my excellent pitch and musicianship, and also noticed my inability to read notation.

Finally, my early education and love for music were solidified when my parents periodically brought me to New Orleans Symphony concerts. I went yearly to the holiday presentation of *The Nutcracker Ballet* accompanied by the symphony. I also went to several Broadway presentations of popular musicals with a live orchestra. In each case during intermissions, I was allowed to get close to the musicians and see the different instruments on

stage or in the pit. Occasionally, the musicians chatted with the young people gathered around. I credit all of these endeavors—Mrs. B.’s teaching, Mrs. H.’s music appreciation, piano, choir, and music classes, as well as my firsthand experience of musical performances—for positively re-enforcing my love for music.

In my general studies, I excelled in math classes and faked my way through English. Because I struggled with reading and writing, my mother assisted me by explaining the context of the assignments, typing, taking dictation, and translating my papers. After gifting me a passing grade for cursive writing, my third grade teacher told me, “When you write in the future, you should stick to print because your cursive is completely illegible.” Somehow, I managed straight “A’s” in elementary school, which is one possible reason my dyslexia went unidentified for so long.

At age 11, my family relocated to Fairfax County in Northern Virginia because my father received a new job offer. My previous knowledge of music and cultural enrichment in New Orleans led me to pick up a wind instrument for the first time at my new school. “Mr. B.,” my music teacher in sixth grade, came to my classroom in September and asked the class, “Hey, who wants to try out for band?” I volunteered and went to try out some instruments. I noodled around on the clarinet, which was not for me because I did not want to play my dad’s instrument. Flute was a no-go—I could not make a sound. Trumpet was my choice because I thought I could be the next Louis Armstrong. I had band class once a week after school for three hours.

Musical notation continued to be a source of frustration. Even though I had spent seven years singing in choir and four years playing piano, I still had not learned to “read” music. The

frustration continued even as I began to play the trumpet. I remember trying to recall the mnemonic devices for the letter names of the staff, but failed to remember them. Did the mnemonic start from the bottom line or the top line? I could remember where the middle-C key was on the piano, yet I could not recall where it was on the staff. One day, Mr. B. instructed me to think of the mnemonic devices for the treble staff as always pointing up. He drew an arrow on a practice sheet for me indicating the direction of the mnemonic. He then taught me to learn the two notes below the staff using the association of "D.C.", as we lived near Washington D.C. I finally learned to read notation, at least the treble clef.

When I first started playing my trumpet, I practiced in the kitchen while my mom prepared dinner. She was incredibly supportive of my early struggles with fine motor coordination. She constantly pushed me to try again, and when I played a familiar tune from my beginner book like *When the Saints go Marching In*, she sung along to encourage me further. Being a good son, I wanted to please my mother. Because she enjoyed my practicing, I was encouraged to stick with the trumpet, rather than move on to other interests. In the short term, I still loved school and had yet to experience any difficulty with grades through the end of elementary school. I believe I was able to succeed because of my intelligence and GT higher level thinking skills. This, of course, would not last. When I graduated into intermediate school, classes became significantly more difficult.

5.4 Intermediate School (7th-8th) and High School (9th-12th)

In seventh grade, I entered Thoreau Intermediate School. Because I had just learned the trumpet, I was placed in "beginning brass class." This class was made up of all brass instrument

students who were relatively new to their instrument, but had not yet reached the required proficiency for full band. My new band director “Mr. S.” was an interesting case as a teacher. He loathed teaching the younger students and often made it clear that he would rather be teaching high school band. Regardless, he was extremely successful as a middle school band director. The Symphonic Band at the school won numerous awards and was considered to be one of the premier middle school programs in the state. I enjoyed band thus far, but my interests were scattered: I still loved singing, but my voice was changing; I was interested in theatre because my oldest brother was involved with theater in high school; I excelled in soccer, where I actually felt comfortable and had friends; and I was adequate at the trumpet, but not exceptional.

I remember in October of my seventh grade year, Mr. S. was teaching us basic music theory, and I was answering all the questions quickly and correctly. Later that same week, he came to me with a horn and cassette tape with instructional material, and flatly said, “Go learn this.” I was distraught. I wanted to play jazz. I wanted to be Louis Armstrong! Horn, I thought, was a “girl’s instrument” because only girls played horn at Thoreau Intermediate School. I also thought I was getting better at playing trumpet, so why was I being punished? After sharing these misgivings with my mother, she was not happy about me saying that it was a “girl’s instrument.” Her response, after I argued about not wanting to play the horn, was to have me take the horn out of the case. She looked it over. Then, as she handed it back to me, she exclaimed, “Look all over the horn for any writing that says girl’s instrument!” At the time, I was unsure what she was doing, but later came to realize her meaning: Mom always knows best. She then instructed me to “march straight upstairs and practice that horn!” Little did I know, in

sixth grade the only options for instruments were trumpet, trombone, flute, saxophone, and clarinet. The band director did not assign the other instruments until seventh grade, based on the development of the students on the instruments from sixth grade. I later learned from Mr. S. that he thought I was playing the trumpet well, but he thought I would excel on the horn.

Things at first were great on the horn. I was able to match the pitches that I needed to play extremely well. I was able to master the middle school range of the instrument pretty quickly. My parents signed me up for private lessons with my future high school band director, "Mr. C.J.B." I was gaining momentum and loving the horn, when suddenly, I began to have issues in the classroom. Mr. S. proclaimed in front of the whole class, "Ben, you need to tap your foot to the metronome. Stop tapping the rhythms!" Further, "Ben, sit up straight. Hold your horn properly. Stop being restless!" Boy, was I having a hard time. I tried to sit up straight and focus on my playing position, but then I played poorly. I could focus on the fingers and note shapes but sounded bad; or I sounded great, but pressed the wrong buttons down in the incorrect order. Despite my 15-20 minutes of daily practice, my parents and Mr. S. felt that a "lack of practice" caused my playing struggles. Yet, I was still improving and enjoyed my band experience.

In seventh grade, I performed my very first solo in a contest, *I Attempt From Love's Sickness to Fly* by Henry Purcell. It was here that I discovered my love for the adulation and positive feedback that a good performance provides. The judge remarked after the performance that I clearly loved the song and knew how it should be played musically. Since I was not singing anymore due to my vocal changes, I took the fork in the road by quitting choir in order to solely focus on horn. However, for the first time, I became aware of my severe

anxiety in performance. I had never experienced nerves to this degree when singing a solo in choir. I shook uncontrollably and could only focus on my nervousness.

Intermediate school was also the beginning of my academic struggles with all things related to reading and writing. In Virginia, there were no GT based instructional classes, only pre-AP and AP (advanced placement) classes for advanced students. Because I was an “A” student and excelled at math and science, I was placed in all the advanced classes, including English. My nightmare with English began at this time. I can remember distinctly loving school but dreading going to English. I began getting “B’s” and the occasional “C” in English class. At first, my parents wanted to make sure I understood the material and that I completed the work. Of course, some of my struggles were because of procrastination and a lack of attention to reading, but even more so because I did not want to read. Reading was a challenge. I needed to read material two, sometimes three times to understand it. I would sometimes read whole pages and chapters and not comprehend anything. While I could do my math homework in 10-15 minutes, it would take me three to four hours to do my English assignments.

My English struggles climaxed when I entered James Madison High School. My ninth grade English class, AP British literature, was the first time I got a grade of “D.” I tried my hardest to understand Shakespeare, Chaucer, and *Beowulf*, but failed mightily. As well, advanced math that year was Geometry. This course was more word based theory instruction and less about numbers and calculation, which meant I did not have my math class to look forward to anymore. I remember getting into an argument with my mother, who was a geometry teacher, “I can show in the numbers that it’s a right triangle; why do I need to know that it’s because of the Pythagorean theorem?” My parents, who were beside themselves at

this point because neither of my older brothers had problems in English and were not having behavioral challenges, decided to have me evaluated by a psychiatrist for ADHD.

At the time, ADHD was the new, in-vogue, cure-all for teenage schooling issues. Just prior to their decision to have me evaluated, my father and aunt were diagnosed with adult ADHD. My father learned about the hereditary component of ADHD, which led my parents to have my brothers and me evaluated. Of course, there was no specific test for ADHD, so I was put through some focus-based instruction tests, and my teachers were given surveys about my classroom behavior and attention. My testing produced “inconclusive” results, but deficits in reading and attention were readily apparent. The psychiatrist felt it important to try a course of stimulant medication to see if treatment would lead to the diagnosis. Sure enough, by the end of ninth grade after six months of medication, I was getting “B’s” again in English. While it was easier to complete tasks because my focus was better and my hyperactivity and impulsivity were under control, reading and writing were still difficult, time-consuming endeavors. Since my grades were now “acceptable,” no further evaluation for reading struggles was pursued.

The other aspects of high school went along great. Specifically in band, I qualified for the last chair in the top band as a freshman. I was so excited to finally start marching band, because I hoped that one day we could travel to New Orleans and march in a Mardi Gras parade. At first, I was apprehensive about marching since I had to learn a new instrument—the mellophone. I was very nervous, remembering that my other experiences on different instruments had ended in either failure or had taken a long time for success. However, when I realized the fingerings were the same as the trumpet, I knew I could succeed. An added benefit was that marching band had finally “cured” my propensity for tapping my rhythms rather than the pulse. My

medication was very helpful to me in band class, as I was able to sit still during rehearsals and not be a disruptive presence in class. I loved playing my horn, but learning scales and technique proved difficult. I “passed-off” the required material, but nothing stuck.

My life took an unexpected turn in 1996, when my family had to relocate again—this time to Southern Virginia. I was a rising junior at the time and was very emotionally damaged by this move. I had difficulty making friends my whole life because of my “boisterous” personality. I finally started forming meaningful relationships when we had to relocate. Not only did we move, but, we moved from a big city suburb to a small, agriculture-based town (South Hill, VA) with a population of less than 5000 people. The town greeted us with a large sign proclaiming, “Welcome to South Hill, VA, Where Tobacco is Gold.”

My disappointment was magnified because Madison’s Concert Band had just won the Tri-State competition and performed a concert at the Kennedy Center. Leaving Madison in Fairfax for Southern Virginia created quite the culture shock for me. However, the relocation did come with some unintended benefits. Because it was a small town, the school was about a year behind the curriculum I received in Northern Virginia. My eleventh grade English class at Park View H.S. was exactly the same curriculum that I just completed in tenth grade. Therefore, the first year was easy for me since it was just review material. Another benefit was that the English class was Dual-Enrollment, which allowed me to receive college credit for English during high school and skip the class entirely in college. As well, while the quality of the band was better than other small town programs in the state, it was still a small town program. During half time at the football games, some of the football players removed their helmets and shoulder pads, picked up their instruments, and participated in the band’s half time program. I

went from feeling that I was lost in the shuffle at Madison H.S. to being looked at as the “star” player at Park View High School. I excelled in my new band program, receiving the “Musician of the Year Award” in both 11th and 12th grade. I also qualified for and played in the district bands both years. The band directors I played for during those two years always felt like I was quite the musician. They appreciated my understanding of phrases and musical intuition, despite my physical limitations on the horn. This positive feedback further solidified my desire to major in music in college.

I still struggled with certain aspects of my playing. I went two years without private tutoring since there were no professional horn players within 100 miles of my town. The only recourse I had left was to attempt to implement the information I had learned from Mr. C.J.B., my previous band director, who was a retired professional horn player and also my private tutor while at Madison High School. I progressed to being capable of playing, for the most part, all 12 major scales, but always made one or two fingering mistakes. It was not that I did not know the keys or the fingerings, but the coordination at fast tempos eluded me. Memorization of the scales proved difficult as well, because I could never cross the sub-vocalization barrier of naming the notes or the fingers in my head while playing through the scales. I attempted all of these things with an incorrect embouchure that was a holdover from my trumpet days. However, none of these deficits proved significant, as I won a spot to begin my collegiate music studies at Virginia Commonwealth University (VCU) in Richmond, VA.

5.5 College Life in Music School

I enrolled at VCU in the fall of 1998 and was immediately thrust into the standard course work of a performance major. At that time, VCU curriculum required at least four semesters of piano skills, five semesters of music theory, five semesters of aural skills, and four semesters of music history. These requirements were coupled with my normal private lessons, band, orchestra, and chamber music schedule. I also took music electives including two composition courses, counterpoint, and conducting. I excelled at music theory, composition, and counterpoint, but piano skills, aural skills, and music history were the most challenging courses for me. I was the only horn player accepted the year of my enrollment, so I had significant playing responsibilities. After looking back on my difficulties in each of the classes with which I struggled, it is not surprising to see the connection with my ADHD/dyslexia.

With piano class I finally received another opportunity to learn the piano. My previous studies proved useful, as my first two semesters involved learning scales and playing simple two-voice melodies. It was not until I got into the third and fourth terms that I struggled. In Piano III and IV, I performed standard Alberti bass lines, chord progressions, and figured bass with the left hand while playing right hand melodies. I found it easier to memorize the notes and progressions so that I could look at the keys while playing. However, my instructor insisted that I keep my eyes on the music. When I took my eyes off the keys to focus on the notation, I struggled to coordinate my left and right hands simultaneously. When I finally practiced enough times to pass an assignment, the teacher then asked me to add foot pedals in the appropriate places. Unfortunately, I never quite mastered the coordination needed to play with all four

limbs. My empathetic teacher modified my assignments by omitting the foot pedals, thus allowing me to earn “B’s” in Piano III and IV.

The Aural Skills class was the most beneficial yet frustrating for me at VCU. I enjoyed putting music theory into practice through singing, as well as identification of chord progressions through harmonic dictation. However, recurring rhythm, pulse, and coordination problems made the rhythm portion of Aural Skills extremely difficult. In all five semesters of the course, we delved into complex rhythms. We received grades for conducting and counting aloud using the basic counting system as well as performance of two-handed rhythms.



Two-Hand Rhythm from *Elementary Training for Musicians* by Paul Hindemith¹⁷³

I spent hours a day attempting to move my body in time while conducting, counting, or tapping. I attempted to remediate my poor pulse and rhythm through intense practice.

However, looking back, I realize that I learned to mimic and approximate the other students’ skills instead of fully and independently internalizing the rhythms. This mimicry meant that while I approximated correct rhythms, I never played exact rhythms, most notably in the dotted-8th-16th figure. Even though these skills were difficult, they were achievable. I improved over time and passed off all the required assignments. However, nothing prepared me for the level of frustration I experienced and continue to experience during melodic dictation.

¹⁷³ Paul Hindemith, *Elementary Training for Musicians*, 2nd ed., rev., (Mainz: Schott, 1946), 33.

In VCU's Aural Skills class, the expectation was to identify and notate the pitch and rhythm of a melody in two hearings. We were given approximately two minutes to dictate the melody. If the rhythm was simple (e.g., quarter and eighths), the tempo slow, and the example short, I was able to successfully complete the dictation. I was excellent at identifying intervals and pitches. However, when the rhythm or meter was more complex, the tempo faster, or the example long, it was too much information for me to process. During a test, my first step was to scratch out the rhythm upon the first hearing. I found it too distracting to dictate while listening, so I attempted to memorize the example and dictate the rhythm from my short-term memory. However, poor short-term memory and distractibility meant that I was only able to dictate rhythms from the last half of the example. When it came time for the second hearing, only half of the rhythm was complete and none of the pitches identified. I went into full panic mode. The anxiety prevented me from doing anything useful with the second hearing.

After failing numerous melodic dictations, I tried reversing my methodology by focusing solely on the pitches during the first hearing. This technique was more successful, as I was able to sketch out the correct pitches after only one hearing. However, because I focused solely on the pitches, I had only one more attempt to get the correct rhythms, which was never enough time. My handwriting was so illegible that half the time I could not read the notes or rhythms I scratched out in my haste to finish quickly. An untimed melodic dictation, extra time to think and write between and after hearings, a pause after the first half of the dictation, or a private screening would have allowed me to be more successful. My failures on melodic dictation led me to receive solid "B's" in all of my Aural Skills classes at VCU.

Music History was my least favorite subject. First, let me say that I love the subject of music history. Knowledge of history is integral to my success as a performer and teacher, and I enjoy putting stories into context. I prefer listening to audio books or having someone read to me so that I can focus on the topic, rather than the act of reading. At first, I was excited to attend music history class because it was a subject that related to my field, but the massive amount of time it took to accomplish the reading and writing assignments took away from that enjoyment. I struggled to get through the copious amounts of assigned reading material, only to spend hours rereading everything for comprehension. At the time, rote memorization of facts and dates did not translate into how well I could play my horn. Ironically, in high school, I spent hours dedicated to passing my dual-enrollment English courses so that I would not have to do so much reading and writing in college, which for me, was time I could devote to my horn playing.

An example of my difficulties with reading and writing occurred during my Music History II class. The final assignment was a research paper about a 19th-century composer. I had a 98% average in the class up to that point. I knew that if I got an 80% or higher on the final, which I did, I would get an overall “B” for the class, even if I did not turn in the final paper. I chose not to write the final paper because it was too difficult for me to read the endless amount of material necessary to write the paper during the time when all of my other final exams, papers, and playing exams were due. While this decision may seem like laziness or apathy, it was not. The decision was calculated. My other courses would have suffered greatly if I dedicated the time needed to complete the assignment. Needless to say, my professor, who liked me very much, was quite disappointed with my decision to ignore the assignment. I hated the idea of

burning a bridge with that professor, so I reluctantly agreed to finish the paper during the Christmas holiday—a time when I could focus solely on the paper without any added end-of-semester pressures.

My love for music gave me a craving to compose. When I was young, I sat at the piano and noodled cool-sounding combinations of notes without ever writing anything down. Since my piano technique was so poor, I had trouble performing what I heard in my head. I took the requisite courses at VCU to qualify for a composition double-degree. However, VCU did not offer the option of a composition and performance double-degree, so I chose to major in performance. I enjoyed composition, especially because of the influence of a wonderful private teacher. However, composition was not without its difficulties. Once again, my struggles with rhythms reared their ugly head. I found it impossible to decipher the sounds and rhythms in my head and then be able to notate them on paper. One of my composition professors wanted me to only write music long hand without using any other tools at my disposal. He felt it was an important skill to be able to write without the crutch of computer software. Despite my professor's wishes, *Finale* notation software allowed me to compose rhythms with instant feedback. I used the software to parse out the correct rhythms then transferred them onto staff paper for the assignment credit. While my professor and composition peers looked down on this crutch, *Finale* allowed me to compose a piece in honor of 9/11 for debut by the VCU Symphonic Wind Ensemble. To much fanfare, the VCU Symphonic Wind Ensemble performed my composition in the spring of 2002.

As for my horn playing, I was fortunate enough to study with the Principal Horn of the Richmond Symphony and Adjunct Professor of Horn at VCU, "Professor A.P.," whose influence

had a major impact on my life. His son was also GT with ADHD, so he was able to empathize with my specific learning challenges. He understood the importance of activating both sides of the brain. He came up with an exercise to finger difficult passages with the right hand instead of the left. As the left-brain controls the right hand, his thought was to try to strengthen and activate the deficient, left side of my brain. He also assigned Kopprasch etudes (standard technical etudes for hornists) in all suggested transpositions and taught me to alter rhythms in certain passages in order to facilitate the finger technique. We spent countless lessons going over the orchestral repertoire, learning the proper technique and style for the period. He instructed me to sing my parts extensively to discover how to shape the phrases. However, I was not able to physically reproduce my vision of how I wanted the excerpts to sound. Professor A.P., while a wonderful mentor and musical influence, was not able to successfully help me correct my fundamentals in a way that would allow me to achieve excellence on my instrument. I still made the same little mistakes I always did: missed fingerings, ignored articulation, approximated rhythms, and general lack of facility on the instrument.

I finally reached my senior year in college with one last hurdle to overcome to earn my degree: the performance of two solo recitals. The first recital was 30 minutes in duration and the second, 60 minutes. My horn professor and I chose a collection of appropriate recital repertoire, and I practiced countless hours attempting to master the art of Mozart, Strauss, and Haydn. In spite of those countless hours, I became paralyzed with anxiety during the performances. I always experienced nervousness while performing for my professors at juries (the performance equivalent of final exams), but remained mostly composed during those short ten-minute performances. In large ensemble performances, I felt calm as long as I did not find

myself excessively exposed on a solo. At my first solo recital, however, something changed. Despite being prepared to the point of near memorization with a strong academic understanding of the music and an innate sense of musicality, the music fell flat and was uninspired. I shook uncontrollably for the entirety of the performance. I remember focusing on nothing but how to stop the shaking so that I could play the pieces I had worked so hard to prepare. I had no attention left for the music.

Prior to my second recital, I prepared for the nerves by doing mock performances for friends and family. On the day of the performance, I exercised early in the day to get out the excess energy. I even did breathing exercises to try to slow my heart rate. None of the physical or mental tips I received from my peers worked. My senior recital was a 60-minute long battle with my nerves instead of the beautiful, inspired performance I expected and experienced during the mock recitals. Both recital performances received passing grades and my professors were proud of my accomplishments. However, I knew I was capable of more if I could only stop the shaking.

5.6 Post Graduate Studies

After successfully completing my recitals, I graduated from VCU in 2003. I knew that I needed more training before I would be prepared to win an audition for a professional orchestra. My playing lacked a full range of development, my tone was not yet exceptional, and I required more ensemble experience. I knew my training was incomplete, so I sought out an expert diagnostician and technician to overhaul my playing. I auditioned and was accepted into the master's program at Louisiana State University (LSU) to study with "Professor. S.O." He

remarked that I won the audition because of the high level of musicianship I demonstrated on Wendell Hoss' transcription of the first movement of the Cello Suite No.1 by J.S. Bach.

During orientation at LSU, I was tested for proficiency in music theory, aural skills, and music history. I aced the theory portion of the exam. However, because of past difficulty with melodic dictation and history, it was not surprising that I failed the other entrance tests, requiring me to take remedial Aural Skills and Music History. Luckily, I was allowed to retake the history placement exam the following year. Knowing that it would have the exact same questions from the previous year, several of the graduate students "memorized" those questions and answers, allowing us to pass the test the second time.

However, attempting the Aural Skills placement test again was pointless, as I knew I needed to take the course. Once again, melodic dictation was challenging. This time, my Aural Skills teacher provided me with some private remediation techniques and awarded partial credit, unlike at VCU. Because of this extra help with melodic dictation and the absence of rhythm assignments, I managed an "A" in the course.

Horn playing was my main focus throughout my time at LSU. At VCU the weekly hour-long lesson expectation was to prepare an etude, a section from my solo, and possibly an excerpt. However, Professor S.O. had much higher expectations. He expected two to three etudes, numerous excerpts with transposition, a large portion of a solo, and any of his fundamental exercises in all keys. Professor S.O. quickly identified my difficulties with rhythms. On more than one occasion, he pointed out my inability to play the dotted-8th-16th figure perfectly. While preparing the Sonata for Horn by Paul Hindemith, I remember arguing with him

that I was 100% sure that I was accurately subdividing the rhythm in my mind. I felt like he was just picking on me.



***Sonata for Horn, movement 1* by Paul Hindemith¹⁷⁴**

The pivotal moment in my horn studies occurred in December of 2003 when Professor S.O. discovered a holdover embouchure from my early trumpet days. He realized that I was not going to progress any further with my current embouchure setup. An embouchure change was necessary. This breakthrough was incredibly emotional because I was unprepared to deal with a fundamental change of that magnitude. I felt that I had wasted five years of my life practicing incorrectly. I had reservations about my future success and was concerned that it was too late in my development to make such a dramatic change. However, making the change was the best decision of my career. The fundamental difficulties in my playing (tone, range, endurance, flexibility, and dynamic range) instantly improved. I could finally play my horn with proper tone and flexibility like a professional. All of the other technical aspects of playing and reading still needed improvement, but now I possessed the physical mechanics and stamina to progress. I finally experienced significant advancement on the horn.

Also, at this time, Professor S.O. and I began to discuss my anxiety issues. I discovered that I needed to take medication during performance to reduce my excessive, stress-induced adrenaline response. I never considered taking that kind of medication before. My professors at VCU thought that anti-anxiety medication was unnecessary. I should not get anxious while performing, and if I did, I just needed to “deal with it.” However, Professor S.O. explained to me

¹⁷⁴ Paul Hindemith, *Sonata for Horn in F and Piano*, (Mainz: Schott, 1939).

that with the combination of my prescription ADHD stimulant medication and the overwhelming performance anxiety I experienced, there was little hope that I could just “push-through” or “overcome” my physiological reaction with willpower alone. This discovery was enlightening and helpful. With the aid of low-dose beta-blockers, I no longer experience uncontrollable shaking while I play, and can focus on making music.

My academic studies went exceptionally well, as I only had two major papers to write while at LSU: a pedagogy study (which was just a synthesis of my years of practice and teaching) and a music history paper (which was the only major project on my plate at the time). Despite my difficult start at LSU, I graduated in 2005 with a Master of Music degree in horn performance, and my professors thought me a mature adult and performer by the time I left. Yet, after finishing my studies, I still felt as though I needed further development in my playing. I knew that in order to reach my eventual goal of teaching in college and playing professionally, I would need to complete a doctoral program. I auditioned and was accepted into the studio of “Dr. S.” as a teaching fellow at the University of North Texas (UNT). As he is a wonderful horn teacher with many years of experience in guiding horn players to professional careers, Dr. S. became a great influence.

Dr. S. quickly discovered my lack of finger dexterity and struggles with reading music. He helped me to fix the majority of my fingering difficulties through intensive scale studies. To combat the note reading issues, he assigned advanced etudes by Bitsch, Dubois, Chaynes, and Reynolds. These etudes were more difficult than any of the music I had played previously from a tonal, mechanical, and visual standpoint. While they pushed me to see more patterns and to move beyond the sub-vocalization barrier (saying the note names in my head while playing),

they required a level of concentration that prevented me from executing anything but the notes and rhythms. After playing a Bitsch etude, Dr. S. commented, “While it was great that you were able to play the notes, you missed 90% of the articulations and dynamics.” He went on to say, “I would hate to ride in a car with you. It’s like you would get from point A to B but you would miss all the stop signs, yields, one-ways, and pedestrians.” Of course I was beside myself because it was difficult enough to focus on the notes and rhythms. Together, we surmised that I was just guessing and improvising the other elements. I felt inadequate. I knew I was an advanced enough player and intelligent enough to understand and interpret all of the markings. How was it that I could not perform 100% of the symbols on the page when others could? Later discoveries led me to the solution to this conundrum.

In addition to the notational reading errors, Dr. S. also picked up on my lack of rhythmic accuracy. While working on an excerpt, the short call from Wagner’s opera *Götterdämmerung*, Dr. S. noticed that I could not precisely subdivide the 8th, dotted-8th-16th triplet figure. He suggested that I use a phrase with words to help me remember the correct sound of the subdivision.



***Götterdämmerung* by Richard Wagner¹⁷⁵**

This tip (from hornist Christopher Leuba) blew my mind. I instantly played the excerpt much better. It led me to further discover the wonderful world of Orff-Schulwerk and word rhythms

¹⁷⁵ Richard Wagner, *Götterdämmerung*, WWV 86D, score, 1848-1874, International Music Score Library Project, Petrucci Music Library, accessed September 25, 2016, [http://imslp.org/wiki/Götterdämmerung,_WWV_86D_\(Wagner,_Richard\)](http://imslp.org/wiki/Götterdämmerung,_WWV_86D_(Wagner,_Richard)).

as aids for decoding rhythm more precisely.¹⁷⁶ Before the utilization of words, I “felt” rhythm and was never quite able to subdivide in my head using the basic counting system. By attaching words to the rhythm, I was able to focus my attention on something more tangible, which freed me to focus on the music. In spite of these playing achievements, the Doctor of Musical Arts (DMA) program at UNT was not without its challenges.

Once again, I found myself in need of more remediation for melodic dictation in remedial Aural Skills. After a two-year dictation hiatus, I failed the entrance exam. Aural Skills at UNT was different from all of my previous courses. “Dr. L.O.” developed the course to heavily focus on dictation and solfège singing. In fact, our final project was to dictate our favorite song without the assistance of piano, computer playback software, or our instrument. I chose *Brooklyn* by Youngblood Brass Band. Once again, figuring out the pitches was easy, but notating the complex rhythms was difficult. Dr. L.O. remarked that all my rhythms were “mostly” correct but all wrong at the same time.

Not surprisingly, I also failed the music history portion of the entrance exam, so I had more reading and writing ahead of me. I faced having to take two semesters of doctoral level music history on top of two masters-level remediation courses. The doctoral-level music history courses were incredibly difficult for me because of the sheer amount of dense reading involved. Luckily, I had two peers in both classes that were vital in helping me to understand the material. The three of us would all read the assignments then have discussion sessions, which helped me tremendously with my content mastery. I would even bounce ideas off of Dr. S. when the subjects were relevant to the development of the horn repertoire.

¹⁷⁶ Jane Frazee, *Discovering Orff*, 14-19.

As for my playing, things really began to click. I won the position of third horn in the San Angelo Symphony, which I have held for the past ten years. I began teaching horn lessons to middle and high school students immediately after moving to north Texas. After four years of teaching, my studio grew to 50+ students and I was a full time teacher and musician. I finally had achieved my major goals. However, my journey was not yet over. Through my teaching, I finally discovered my dyslexia.

5.7 Professional Music Career and Private Teacher

In my second year of teaching at one particular middle school in north Texas (my fifth year of overall teaching), I enrolled a new student, "C.W." I met her the year before, but she had been too apprehensive to begin lessons. Realizing that she was extremely far behind her peers, her father enrolled her in lessons during her eighth grade year. C.W. demonstrated numerous, yet expected challenges in her horn playing: incorrect embouchure, poor breathing and use of air, small range, and poor tone. After a few weeks of getting to know each other, getting her to feel less anxious about being in private lessons and addressing her numerous mechanical challenges, I began to notice unexpected note reading deficiencies. After two full years of band class, I was surprised by her inability to read the notation quickly and correctly. She needed to play very slowly, not for the sake of coordination, but to process what she was seeing on the page. Even still, I noticed that she kept playing C's instead of A's and B's instead of D's during a passage in her region etude. I brought her attention to the matter. She knew the correct notes while not playing her horn, but as she said, "It looks like a C when I get there." I

off-handedly and ignorantly remarked, “It’s almost as if you’re dyslexic.” She responded back, “Well, that’s because I’m dyslexic!”

Having had zero-experience teaching students with dyslexia (no one admitted to it previously), I did not know how to help C.W.. I immediately did some light “arm-chair research” and found out that transparent, colored overlays could be helpful. Her parents purchased a multi-pack of colored plastic dividers to try in the next lesson. She put the orange color on top of her etude, which immediately improved her reading. Additionally, I exclaimed (about myself), “Wow! That’s a lot clearer.” I was a bit surprised that I had such a strong reaction to the overlay because I was not dyslexic (or so I thought). Needless to say, I was very confused.

That evening I spoke about the lesson with my wife, a flute teacher and performer. Knowing about my unique proclivities towards reading and writing, she immediately jumped into action to get to the bottom of the mystery. What we learned changed my life. We bought Liz Dunoon’s book on CD, *Helping Children with Dyslexia: 21 Super Strategies to Ensure Your Child’s Success at School*, and discovered that I identified with most of the dyslexia umbrella (six of the eight subtypes). With each personal story Liz Dunoon told, I repeatedly thought, “Wow! That’s me!” How was it possible that I escaped diagnosis for 32 years? I chronicled my life story to bring to a brain performance center that next summer. I was evaluated through the use of a quantitative electroencephalogram, a brainwave detection device, to determine if any portions of my brain were malfunctioning. Sure enough, there were more discrepancies in my evaluation than just typical ADHD patterns.

The diagnosis was life changing. Since the discovery of my comorbid ADHD and dyslexia, I have researched and incorporated as many remediation techniques into my own life as

possible. During performances, colored overlays improve my accuracy. They allow me to see and process all of the information on the page—not just notes and rhythms, but articulations, dynamics, and musical terms. Word rhythms help me to subdivide. After years of approximating the dotted-8th-16th figure, I am now capable of playing it accurately along with many other complex rhythms. I can also enter difficult rhythms into finale and listen to the playback to make sure that I am interpreting them correctly. A vibrating metronome has been the best tool for remediation of my inconsistent pulse. Fidget toys help me to relieve excess energy and focus when my brain becomes scattered. In my teaching, my understanding of ADHD/dyslexia allows me to be patient, versatile, and open-minded with struggling students.

Initially, I had mixed feelings about my new diagnosis. I was sad and angry that I “fell through the cracks” in the public school system. My life would have been so much easier with an earlier diagnosis, remediation, and accommodations. I wonder daily what successes, prestige, and opportunities I missed because of a late diagnosis. But, I also realize that testing is imperfect, and new research has dramatically changed our knowledge of ADHD and dyslexia. I also know that things could have been much worse without my early GT training and incidental remediation from my parents and Mrs. B. I am grateful for my early piano lessons, my aural skills training at VCU and LSU, the patience of my horn professors and music teachers, and the help and support of my wife. If not for my dyslexia, it is also possible that I may not have developed heightened musical instincts, good pitch recognition, and strong intonation. My life is not any easier, but my life story as a whole makes much more sense. I understand my strengths and weaknesses and how to overcome them. I am excited to help others like me through this project, my advocacy, and my teaching.

CHAPTER 6

ADDRESSING THE PROBLEMS

6.1 Introduction

In spite of the numerous methods for remediation of musical deficits, students with ADHD/dyslexia may continue to struggle with certain aspects of their training to the point that an impact on their grades might be unavoidable. In these more severe cases, the IEP and 504 plan are wonderful accommodative tools that will assist students throughout their sixth grade year. Two topics must be addressed by band directors and private teachers in order to achieve a measure of success with these students: they must familiarize themselves with the benchmarks laid out in the TEKS curriculum, and they need to understand and be aware of the musical deficits the learner with ADHD/dyslexia may confront.

The fine arts are part of the core curriculum in Texas.¹⁷⁷ Middle school and high school students must each take one year of a fine arts course.¹⁷⁸ Currently, the state of Texas does not require students in fine arts to take a standardized test, such as the State of Texas Assessments of Academic Readiness (STAAR), to evaluate the successful completion of benchmarks laid out in the TEKS.¹⁷⁹ While, due to relaxed administrative accountability, there may not be a need for specific modifications or accommodations to the TEKS fine arts curriculum, it seems appropriate and helpful to suggest modifications and accommodations to the grading practices in those classes.

¹⁷⁷ Curriculum Division, "Texas Essential Knowledge and Skills."

¹⁷⁸ Texas Education Code, Title 2, Subtitle F, Ch. 28, Subchapter A, § 28.002, amended by Acts 2015, 84th Leg., R.S., Ch. 1175 (S.B. 968), Sec. 1 (June 19, 2015), accessed September 25, 2016, <http://www.statutes.legis.state.tx.us/Docs/ED/htm/ED.28.htm#28.002>.

¹⁷⁹ Texas Education Agency, "STAAR Resources," accessed April 11, 2016, <http://tea.texas.gov/student.assessment/staar/>.

The required curriculum in Texas is two-fold: a “foundation curriculum” (English language arts, mathematics, science, and social studies), and an “enrichment curriculum” (career and technical education, fine arts, health education, languages other than English, physical education, and technology applications).¹⁸⁰ STAAR tests are required for foundation courses, but not for enrichment courses.¹⁸¹ From personal experience as a horn teacher, the quality and enormous discrepancy of material being taught in beginner band (an enrichment course) between different schools and districts is astounding. It is also difficult to create cohesion of standards with the superfluous wording in the TEKS. For example, in §117.208(B)(3) a disclaimer is needed to explain the use of verbiage within the curriculum, “Statements that contain the word ‘including’ reference content that must be mastered, while those containing the phrase ‘such as’ are intended as possible illustrative examples.”¹⁸²

It may be helpful for administrators to amend the fine arts TEKS in the future with more specific, testable requirements that are concise and easily understood. The development of more specific standards and expectations would greatly help students with ADHD/dyslexia (and other disabilities) to understand what is expected of them in music class and for music teachers to know how to provide assistive services to these students. An official list of modifications and accommodations would be easier to develop because of these more simplified, specific standards. Music educators could then discuss the advantages and disadvantages of a STAAR or other standardized test for assessment of these benchmarks. State organizations, like TMEA

¹⁸⁰ Curriculum Division, “Texas Essential Knowledge and Skills.”

¹⁸¹ Texas Education Agency, “STAAR Resources.”

¹⁸² Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

could then release the official list of modifications and accommodations for educators to implement in IEP or 504 plans.

6.2 Examining the TEKS Curriculum for 6th Grade Music Students

§117.208(c) of the TEKS details the benchmarks that a 6th-grade music student should achieve in their first year of study in band class. This chapter will provide the specific language of each expectation as published in the TEC, followed by annotations that would be beneficial for a student with an IEP or 504 plan for ADHD/dyslexia.¹⁸³

(c) Knowledge and skills.

(1) Foundations of music literacy. The student describes and analyzes music and musical sound. The student explores fundamental skills appropriate for a developing young musician. The student is expected to:

(A) Experience and explore exemplary musical examples using technology and available live performances;¹⁸⁴

Assistive technology is a proven method for remediating students with neurodevelopmental disorders.¹⁸⁵ Live performances provide multisensory environments that can leave lasting impressions upon students. Students with ADHD/dyslexia will need constant reminders about proper audience etiquette, due to behavioral challenges.¹⁸⁶

(c)(1)(B) Describe tonal and rhythmic musical elements using standard terminology such as instrumentation, voicing, intervals, solfège, absolute note names, rhythmic values, and counting system;¹⁸⁷

¹⁸³ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

¹⁸⁴ Ibid.

¹⁸⁵ McCord and Watts, "Collaboration and Access for Our Children," 26-33.

¹⁸⁶ Ditchfield, "The Paperwork" in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 78.

¹⁸⁷ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

If a student with ADHD/dyslexia is already struggling with note reading and rhythm, expecting the student to be able to describe these musical elements could lead to severe frustration. Using a word bank, allowing for multiple listening sessions, and changing the counting system so the student can answer in a “call and response” format are beneficial. Students with ADHD/dyslexia should be allowed to use a word processor or dictation software for written essays, or forgo writing altogether by giving an oral report. Students with extreme anxiety might prefer to explain their answers in private, rather than in front of the entire class.

*(c)(1)(C) Describe musical elements of rhythm, including whole notes, half notes, quarter notes, paired and single eighth notes, sixteenth notes, corresponding rests, and meter, including 2/4, 3/4, and 4/4, using standard terminology;*¹⁸⁸

Students with ADHD/dyslexia might have trouble searching for the correct terminology.¹⁸⁹ Using a word bank, allowing for multiple hearings, and allowing extra time for the student to think before being pressured to answer may prove beneficial. It might be helpful to hang a rhythm poster in the band hall for students to reference. Students with timing deficiencies may need accommodative counting systems, e.g., word rhythms.¹⁹⁰

*(c)(1)(D) Identify musical forms presented aurally and through music notation such as binary, ternary, phrasic, rondo, and theme and variations;*¹⁹¹

It takes students with ADHD/dyslexia longer to read and understand a musical score.¹⁹² These students can be easily distracted by something interesting in the music and forget all

¹⁸⁸ Ibid.

¹⁸⁹ Miles, “Parallels Between the Teaching of Musical and Mathematical Notation,” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 69-70.

¹⁹⁰ Overy, “Dyslexia and Music: from Timing Deficits to Musical Intervention,” 497-505.

¹⁹¹ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

¹⁹² Miles, “Parallels Between the Teaching of Musical and Mathematical Notation,” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 69-70.

about the form of the piece.¹⁹³ Ask students fewer questions on tests and give them a longer time frame to complete their answers. It has been found helpful to present musical forms using as many of the senses as possible. Play reward-based games with students, move around the room, analyze popular songs on the radio to understand forms, or have them stand when they recognize a new variation.

*(c)(1)(E) Explore health and wellness concepts related to musical practice such as body mechanics, hearing protection, vocal health, hydration, and appropriate hygienic practice.*¹⁹⁴

A teacher should always model the behavior they desire from their students, especially for students with ADHD/dyslexia, due to their propensity for mimicry.¹⁹⁵ A teacher should be conscious of proper posture and wellness concepts at all times. Teachers should conspicuously clean their instruments at the end of each class period and praise students for doing the same. Students with ADHD/dyslexia need daily reminders of expectations, and must be consistently praised for being on the right track.¹⁹⁶

(c)(2) Foundations: music literacy. The student reads and writes music notation using an established system for rhythm and melody. The student is expected to:
*(A) Identify music symbols and terms referring to notation, including repeat sign; dynamics, including crescendo, decrescendo, piano, and forte; tempi, including accelerando, ritardando, moderato, and allegro; and articulations, including staccato and legato;*¹⁹⁷

¹⁹³ American Psychiatric Association, *DSM-5*, 32.

¹⁹⁴ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

¹⁹⁵ Dunoon, *Helping Children with Dyslexia*, 36-37.

¹⁹⁶ Swanson, "Students with ADHD," 219.

¹⁹⁷ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

For students with ADHD/dyslexia, make sure that the symbols and words on the page are large enough to read with little effort.¹⁹⁸ Choose a sizeable, sans-serif, or dyslexia-specific font. Highlight important items in the score, or print on colored paper.¹⁹⁹ Dots are particularly difficult to see on a black and white score.²⁰⁰ Foreign languages are exceptionally difficult for these students to learn, especially when they typically struggle with their native language.²⁰¹ Give students a story or mnemonic device to equate with a foreign term and provide a word bank.

(c)(2)(B) Notate meter, rhythm, pitch, and dynamics using standard symbols in a handwritten or computer-generated format;

*(c)(2)(C) Create rhythmic phrases using known rhythms and melodic phrases using known pitches at an appropriate level of difficulty within an established system of notation;*²⁰²

Computer software (Finale or other musical notation software) with headphones will allow students with ADHD/dyslexia to experiment with notation and playback, in order to self-determine if they are correctly notating what they “hear.” Allow extra time to check work or allow students to turn in their assignments electronically after spending some time alone, away from the distractions of the classroom and other students.

*(c)(2)(D) Read music notation using appropriate cognitive and kinesthetic responses such as inner hearing, silent fingering, shadow bowing, or Curwen hand signs;*²⁰³

¹⁹⁸ Oglethorpe, *Instrumental Music for Dyslexics*, 49.

¹⁹⁹ *Ibid.*

²⁰⁰ Kriss and Evans, “The Relationship Between Dyslexia and Meares-Irlen Syndrome,” 351.

²⁰¹ Sally Shaywitz, *Overcoming Dyslexia: A New and Complete Science-Based Program for Reading Problems at Any Level*, (New York: Vintage Books, 2005), 124, 318-19.

²⁰² Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²⁰³ *Ibid.*

Discuss and model these behaviors on a daily basis so that they become second nature to the student. Allow students with ADHD/dyslexia extra time to process the notation and respond.²⁰⁴ Consider using colored paper or overlays to facilitate processing speed.²⁰⁵

*(c)(2)(E) Sight read unison and homophonic music using the appropriate clef in a minimum of two keys and three meters, including 2/4, 3/4, and 4/4.*²⁰⁶

The severity of ADHD/dyslexia in the individual will determine the course of action for sight-reading. These students will benefit from an enlarged, colored copy.²⁰⁷ As a general rule, sight-read at 80 bpm or slower.²⁰⁸ Consider substituting a memorization exercise in place of graded sight-reading assignments for students with more severe disabilities.²⁰⁹ Students should be encouraged to sight-read in front of the class, but not for a grade. Grades for sight-reading should be administered individually in a private setting or electronically through a program like SmartMusic. Focus on only one difficult aspect (notes or rhythms) per sight-reading session. Allow 50% extra time when looking at sight-reading before playing e.g., 45 seconds instead of 30 seconds.²¹⁰ Keep the difficulty of sight-reading at a level below the student's potential.

(c)(3) Creative expression. The student demonstrates musical artistry by singing or playing an instrument, alone and in groups, performing a variety of unison, homophonic, and polyphonic repertoire. The student makes music at an appropriate level of difficulty and performs in a variety of genres from notation and by memory. The student is expected to:
(A) Demonstrate, alone and in groups, characteristic vocal or instrumental timbre;

²⁰⁴ Miles, "Parallels Between the Teaching of Musical and Mathematical Notation," in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 69-70.

²⁰⁵ Overy, "Dyslexia and Music: from Timing Deficits to Musical Intervention," 497-505.

²⁰⁶ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²⁰⁷ Oglethorpe, *Instrumental Music for Dyslexics*, 49.

²⁰⁸ Overy, "Dyslexia and Music: from Timing Deficits to Musical Intervention," 501.

²⁰⁹ Daunt, "Chapter 10: Reasonable Adjustments in Performing Arts Examinations," in *Music, Other Performing Arts and Dyslexia*, ed. Sally Daunt, 140.

²¹⁰ Trinity College London, "Music Special Needs."

(B) Perform music alone and in groups, demonstrating appropriate physical fundamental techniques such as hand position, bowing, embouchure, articulation, and posture;

(C) Perform independently and expressively, with accurate intonation and rhythm, developing fundamental skills and appropriate solo, small ensemble, and large ensemble performance techniques;

(D) Perform independently and expressively a varied repertoire of music representing various styles and cultures;

(E) Sight-read independently and expressively, with accurate intonation and rhythm, demonstrating fundamental skills and appropriate solo, small ensemble, and large ensemble performance techniques in known keys and rhythms;

(F) Interpret music symbols and terms referring to keys; clefs; dynamics, including crescendo, decrescendo, piano, and forte; tempi, including accelerando and ritardando; and articulations, including staccato and legato, appropriately when performing;

(G) Create rhythmic phrases using known rhythms and melodic phrases using known pitches at an appropriate level of difficulty.²¹¹

A great deal of leniency and interpretation of the “appropriate level of difficulty” will have to be taken with students with ADHD/dyslexia.²¹² All of the above items, difficult to accomplish for even a neurotypical student, involve multitasking while playing, e.g., performing and sight-reading varied, multicultural solos or ensemble pieces with characteristic tone, intonation, dynamics, articulation, style, rhythm, technique, improvisation, and expression as a beginner, all while playing with correct mechanics and accurate interpretation of symbols. For students with ADHD/dyslexia, it would be helpful to break down and grade each element

²¹¹ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²¹² Overy, “Classroom Rhythm Games for Literacy Support,” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 42.

individually, preferably in a private setting.²¹³ Colored overlays, colored paper, large font, highlighters, pulse metronomes, and assistive technologies are all tools that will help with the multitasking process.²¹⁴ When grading these benchmarks, test at 80 bpm or slower for the best chance of success.²¹⁵

(c)(4) Historical and cultural relevance. The student relates music to history, culture and the world. The student is expected to:

(A) Perform music representative of diverse cultures, including American and Texas heritage;²¹⁶

It is the teacher's responsibility to provide the appropriate level of music and provide a safe, encouraging atmosphere in which to perform.

(c)(4)(B) Describe written and aurally presented music representative of diverse styles, periods, and cultures;²¹⁷

Beginners with ADHD/dyslexia may find it nearly impossible to simply look at a piece of music and be able to determine the style, period, and culture of the music, unless the answer is explicitly written into the title of the piece. Some of these students may be able to determine basic, extremely contrasted styles when presented aurally, e.g., Gregorian chant versus jazz. The teacher should be encouraged to provide students with appropriate vocabulary and descriptive terms in a word bank or in a study guide, which could then be used on an open-book test. The teacher is advised to provide multiple practice tests in class using examples that are extremely similar to those to be later found on tests. Students with ADHD/dyslexia should

²¹³ Swanson, "Students with ADHD," 219; Kathleen A. Melago, "Strategies for Successfully Teaching Students with ADD," 38.

²¹⁴ Oglethorpe, *Instrumental Music for Dyslexics*, 12, 39.

²¹⁵ Overy, "Dyslexia and Music: from Timing Deficits to Musical Intervention," 501.

²¹⁶ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²¹⁷ *Ibid.*

be allowed extra hearings and extra time to give their answers.²¹⁸ They may need a private room, free of distractions for testing, and access to a word processor.²¹⁹

*(c)(4)(C) Identify relationships of music concepts to other academic disciplines such as the relationship between music and mathematics, literature, history, and the sciences;*²²⁰

Beginners with ADHD/dyslexia may have difficulty making connections between music and other disciplines on their own, unless properly prompted. However, when led in the correct direction, these students may excel at identifying relationships.²²¹ Videos and teacher-led discussions will hopefully guide students towards discovering associations on their own. This item should not be graded.

*(c)(4)(D) Describe music-related vocations and avocations.*²²²

When evaluating this skill, allow for an oral presentation in lieu of a written report for students with ADHD/dyslexia.

(c)(5) Critical evaluation and response. The student listens to, responds to, and evaluates music and musical performance in both formal and informal settings. The student is expected to:

*(A) Demonstrate appropriate concert and stage etiquette as an informed, actively involved listener and performer during live and recorded performances in a variety of settings;*²²³

Proper self-discipline, impulsivity control, and proper concert behavior should be explained thoroughly and consistently to the student with ADHD/dyslexia.²²⁴ Having fidget toys

²¹⁸ Trinity College London, "Music Special Needs."

²¹⁹ Melago, "Strategies for Successfully Teaching Students with ADD," 38.

²²⁰ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²²¹ Eide and Eide, *The Dyslexic Advantage*, xvii.

²²² Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²²³ Ibid.

²²⁴ Ditchfield, "The Paperwork" in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 78.

on hand can reduce excess noise and motion. A mock performance would be helpful and would allow students and teachers to make light of wrong choices in a safe, fun environment. These students should be tangibly rewarded for appropriate behavior, such as stickers, reward beads, check marks on a poster, or other imaginative ways.²²⁵

*(c)(5)(B) Identify criteria for listening to and evaluating musical performances;*²²⁶

The teacher is urged to provide students with ADHD/dyslexia a cheat sheet, poster, or a chart that organizes criteria for listening. A posted vocabulary list is a good reference that could help them to describe what they hear.

*(c)(5)(C) Describe processes and select the tools for self-evaluation and personal artistic improvement such as critical listening and individual and group performance recordings;*²²⁷

Beginner students with ADHD/dyslexia must understand how to evaluate themselves but may lack the critical listening skills to do so. The amount of multitasking needed to perform an instrument may prove too much for them to then be able to add another listening skill.²²⁸

Tools for practice of self-evaluation include SmartMusic (instant graded feedback with recording capabilities) and the Practice Center app (inclusive app with audio and video recording capabilities plus added tuner and metronome). Evaluate students after performances and encourage them to self-evaluate out loud in order to insure proper acquisition of critical listening skills.

²²⁵ Swanson, "Students with ADHD," 219.

²²⁶ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²²⁷ Ibid.

²²⁸ Dyck and Piek, "Developmental Delays in Children with ADHD," 475-476.

*(c)(5)(D) Evaluate the quality and effectiveness of musical performances by comparing them to exemplary models.*²²⁹

Students will need to actively listen to exemplary models with the help of their teacher. The teacher will need to lead analytical discussions and provide students with appropriate vocabulary to help them make connections between their own playing and professional playing. This item may not be possible to test.

*(c)(5)(E) Demonstrate appropriate cognitive and kinesthetic responses to music and musical performances.*²³⁰

Cognitive responses to music are personal and nearly impossible to measure without the use of brain imaging technology. Students may be prompted to listen for certain aspects during a performance (e.g., the sounds of nature in Beethoven’s Symphony No. 6 “Pastorale”) and may be asked to describe or draw a picture of what they heard afterwards. Students with ADHD/dyslexia will need practice with this task and a certain amount of leniency in grading.²³¹ Emotional responses may be easier to gauge in extroverted students than introverted ones. Each person’s emotional response may be different based upon his or her own personal experience and amount of training, and should not be judged for appropriateness unless it disrupts the performance. An appropriate kinesthetic response would be to clap at the correct time after a piece of music is finished. All of these responses can be trained behaviorally as proper performance etiquette. The behavior can then be graded, as long as it was discussed in detail beforehand.

²²⁹ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²³⁰ Texas Essential Knowledge and Skills for Fine Arts, Texas Education Code, 38 TexReg 4575, Ch. 117, Subchapter B, §117.208, (July 28, 2013), accessed September 25, 2016, <http://ritter.tea.state.tx.us/rules/tac/chapter117/ch117b.html>.

²³¹ Ditchfield, “The Paperwork” in *Music and Dyslexia*, ed. Miles, Westcombe, and Ditchfield, 78.

CHAPTER 7

CREATING A RESOURCE FOR MUSIC EDUCATORS

7.1 Introduction

The purpose of this resource is to explain the scientific conditions of ADHD/dyslexia, the musical traits associated with these conditions, remediation techniques, a quick reference chart listing these techniques, the differences between an IEP and a 504 plan, suggestions for accommodative services in an IEP or 504 plan, a sample letter to an ARD or 504 committee, a sample letter to a parent of an incoming beginner with an IEP or 504 plan, and a list of resources available to the music educator. This document is a brief, accessible, generalized guide for educators that can be read within a few minutes. The techniques in the resource could provide useful to most students, but an accounting of individual musical traits, severity of disorders, and individual learning styles must be taken into consideration for each student. A comprehensive handout would prove too daunting for music educators to reference during their busy day. If a more comprehensive understanding is required, details can be found within the contents of this paper, or in the resources provided.

7.2 Resource for Music Educators

How to Accommodate or Modify Musical Instruction for a Student with ADHD and/or Dyslexia

This resource is intended for any music educator with students who have an IEP or a 504 plan for ADHD and/or dyslexia. The resource includes general information about the conditions and common difficulties the student might face in the music classroom, and a quick reference guide with helpful teaching techniques. Also included are sample letters to help open a dialogue with parents and special educators about the conditions. As every student is unique, the techniques for remediation, accommodation, and modification are suggestions. Feel free to try all or some of the techniques.

What is Attention-Deficit/Hyperactivity Disorder (ADHD)?

- ADHD is a neurodevelopmental disorder.
- ADHD affects up to 13% of American population.
- ADHD is a pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.
- Inattention inhibits the ability to organize thoughts and materials, stay focused on the task at hand, and listen attentively.
- Hyperactivity-impulsivity involves the inability to be still, quiet, and wait.
- ADHD is a cognitive disorder, not just a behavioral and/or social disorder.
- The student is not willfully defiant or purposefully distracted—it is not a choice, but a biological dysfunction.
- Behaviorally and socially, the student acts three years younger than their actual age.
- Medication improves some symptoms but cognitive and behavioral remediation will still need to occur.

What is Dyslexia or Specific Learning Disorder (SLD)?

- Dyslexia is a neurodevelopmental disorder.
- Dyslexia affects 20% of American population.
- Dyslexia has both a broad and specific definition.
- Narrowly, dyslexia can refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities.
- Broadly, dyslexia can also refer to the more general terminology of Specific Learning Disorder (SLD).
- SLD encompasses eight subtypes of learning difficulties:
 - Dyslexia as phonological processing deficiency (problems with speech sounds)
 - Dysphasia or apraxia (difficulty with pronunciation or the translation of thoughts into words)
 - Dysgraphia (difficulty with handwriting)

- Dyspraxia (difficulty with balance, small and large body movements, muscle tone, and poor posture)
- Auditory dyslexia or auditory processing problems (difficulty with listening, understanding spoken instruction, self-expression, rhyme, and rhythm)
- Visual processing problems (problems understanding symbols, pictures, and distances, despite having 20/20 vision)
- Executive dysfunction (difficulty with ongoing thoughts, time, planning, sequencing, attention, memory, recall, and response)
- Dyscalculia (difficulty with numbers, mathematical symbols, terms, and concepts)
- People with SLD can have a range of one, some, or all of the symptoms listed.
- SLD severity levels range from mild to moderate to severe.
- SLD does not affect a person's intelligence. SLD is an equal opportunity disability, affecting people of all intelligence levels and economic backgrounds.

Why do I as a teacher need to be aware of both ADHD and dyslexia?

- ADHD and dyslexia have a high rate of co-occurrence.
- Scientific research concludes that 85% of children with ADHD also have a mild SLD, 55% have a severe SLD, and 55% have a pervasive SLD.
- Research indicates that 15-40% of children diagnosed with dyslexia also have ADHD.
- Symptoms of both conditions can co-exist and overlap.
- Because testing for ADHD and dyslexia is imperfect and symptoms overlap, a student with one diagnosis may have another undiagnosed condition(s).

Why do I need to offer assistance to these students?

- It is required by law. The Americans with Disability Act of 1990, the Individual with Disabilities Education Act of 2004, and Section 504 of the Rehabilitation Act of 1973 require public schools receiving federal funding to provide reasonable accommodations for students with learning disabilities to succeed in the classroom. They must have access to a "free and appropriate education," including music education, despite the nature or severity of their disability.
- Music is part of the core curriculum in Texas. As of 2010, the state of Texas made it a requirement that students complete one year of a Texas essential knowledge and skills-based (TEKS) fine arts course in middle school (grades 6-8) and one year in high school (grades 9-12.)
- Students with ADHD and/or dyslexia can and will succeed in music, even to a greater extent than their neurotypical peers, with early remediation and accommodation coupled with quality instruction.
- As 20% of the class will likely have dyslexia and 13% ADHD, ignoring the issue could greatly impact the success of the class.

What is an Individual Education Program (IEP) or 504 plan?

- An IEP is a legally binding document for every child receiving special education services as a means of addressing each child's unique learning problems and educational goals.
- An IEP is usually reserved for severely compromised students who require modifications to curriculum in order to succeed in school, including having special education services provided in a **separate** classroom environment.
- A 504 plan is intended for a student with ADHD and/or dyslexia when the disability substantially limits, and therefore, affects performance in the classroom.
- Students with 504 plans may need and are eligible to receive accommodations to better their chance for success in the **regular** classroom with the possibility of some additional supportive services outside the classroom.
- Contents of an IEP or 504 plan may include modifications, accommodations, and/or remediation techniques that are customized to the individual student.
- In Texas, decisions about IEPs are made at an Admission, Review, and Dismissal (ARD) meeting. Decisions about 504 plans are made in a 504 meeting.

What is the difference between *modification, accommodation, and remediation*?

- Modifications are changes to what the student is expected to master in the classroom, and are therefore usually reserved for IEPs. Course and/or activity objectives are modified to meet the needs of the learner. These changes include:
 - Change the rubric or grading scale to meet the needs of the student.
 - Give aural cues and/or prompts during test-taking to help the student remember answers.
 - Do not grade spelling accuracy.
 - Do not grade the accuracy of the translation of foreign musical terminology. (TEKS §117.208(c)(2)(A))
- Accommodations are changes to how content is taught, made accessible, and/or assessed. Accommodations can be assigned to either an IEP or a 504 plan. They can include:
 - One-on-one or small group instruction.
 - Extended time on tests.
 - Large print materials.
 - Shortened assignments or assessments.
 - Private test taking rooms.
 - Note taking assistance.
 - Frequent breaks.
 - In music, not grading a playing test in front of the other students. Allowing for more time in graded sight-reading assessments.
- Remediation is the process of correcting or teaching coping strategies to a student to overcome deficiencies in certain areas. Examples include:

- Reading remediation can take place at an early age to provide the student with a better chance of success in their future, e.g., picturing, inferring, predicting, noticing important parts and functions of a word/sentence, etc.
- In music, the utilization of a pulsating metronome or eurhythmic techniques may help remediate poor pulse.

How does having ADHD or dyslexia impact a student in the music classroom?

- Students with ADHD and/or dyslexia can have mild to severe difficulty learning a musical instrument and/or reading music.
- Musical traits that may prove difficult for students with ADHD and/or dyslexia can include:
 - **Time and pulse:** Research indicates that children with ADHD and/or dyslexia struggle with counting, tapping, playing with a metronome pulse, and accurately subdividing rhythms.
 - **Note reading and processing:** Music and text reading rely on the same posterior sections of the brain. The decoding of musical symbols can be a slow and tedious process for students with either condition.
 - **Pitch recognition and rhythms:** Because of right brain advantages, students with ADHD and/or dyslexia may demonstrate greater pitch recognition and memorization of rhythmic patterns than a neurotypical student. However, the memorization of the pattern does not demonstrate knowledge of rhythm, subdivision, or the ability to transfer the pattern to another piece of music.
 - **Posture and gross motor coordination:** Fidgeting makes it difficult for a student with ADHD to sit still with good posture. Due to multitasking problems, a student with dyslexia may not have the ability to focus on posture, playing, and reading at the same time.
 - **Fingerings and small motor coordination:** Executive functioning problems as well as problems between “left” and “right” make it difficult to execute complex patterns of fingerings. Problems with pencil grip and untidy handwriting may transfer into difficulty with coordination of small finger movements on an instrument.
 - **Fast learning speed:** Students with ADHD and/or dyslexia have the ability to learn the same amount of information as a neurotypical student, even displaying a greater mastery in the end, but at a slower pace.
 - **Anxiety:** The severity of anxiety is magnified in the student with ADHD and/or dyslexia because of an innate desire to please and succeed. Graded playing tests in front of other students can be destructive to their development if the anxiety is not addressed and eased. These students should play for the class, but receive a grade privately.
 - **Organization and practice habits:** Students with ADHD and/or dyslexia will struggle with organizing their time and materials, planning, ordering, improvising, and creating and changing routines.

- **Sight-reading:** Students with ADHD and/or dyslexia will struggle with sight-reading because of difficulty with multitasking, pulse, note reading, and executive functioning. The pressure of the moment will increase anxiety, which could compound the problem.

How can I assist in remediating and/or accommodating these deficiencies if I have no formal training in teaching students with special needs?

- Work with the counselors, special educators, and the IEP/504 committee to create an integral learning environment for the student. Find out if there are any key words you can say to jog the student’s memory or get the student to focus. Post reminders on the classroom walls. Quickly jot down problems or create a voice memo as a personal reminder to discuss problems with the team at a later point during the day.
- Keep a binder or electronic file with each student’s existing IEP/504 plan to reference and update a list of the student’s deficiencies.
- Create a checklist for special educators of expected musical tasks in the classroom. Ask for assistance on how students with ADHD/dyslexia can best accomplish the goals.
- Utilize the following **remediation** techniques to provide the student with musical coping strategies:
 - Use a vibrating metronome for pulse problems.
 - Use a transparent colored overlay for students with visual processing difficulties.
 - Use word rhythms typically used in an Orff approach to provide a better understanding of rhythm.
 - Demonstrate the use of colors for markings in music to help with recognition of symbols.
 - Provide students with eurhythmics training for poor pulse.
 - Provide assistive technologies for practice in note reading, aural skills, and notation writing (e.g. musictheory.net, mynotegames.com, SmartMusic, Finale, GarageBand, etc.)
- Employ any of the following **accommodations and modifications**:
 - Use multisensory techniques—utilize all of the senses.
 - Use multimodal techniques, including visual, aural, read/write, and kinesthetic techniques when providing instructions.
 - Enlarge small print onto colored paper.
 - Use a colored staff or note heads, highlighters, and colored pencils.
 - Allow students to sit closer to the board during written instruction time.
 - Allow restless students the opportunity to stretch by performing an errand or provide classroom fidget toys to help the student focus.
 - Try chair exercise bands for hyperactive students.
 - Provide instructions in multiple formats (aural and written). Leave instructions on the board for the entire class period.
 - Allow students to take a picture of homework assignment instructions from the board or send an email to them or their parents.

- Allow students to record lectures, lessons, and assignments to review at a later time.
- Provide word banks for written tests. Read questions out loud. Allow for assistive technology or word processing with spell check capabilities. Allow for oral presentation of essay answers, rather than written.
- Find a separate, quiet room for testing.
- Allow the student to break down tasks separately during count/clap/tap rhythm exercises. Demonstrate steady foot tapping as separate from counting and clapping.
- Allow a student to use a vibrating metronome for more consistent pulse during playing tests.
- Assess and evaluate graded playing tests in a private setting away from the other students in the class.
- Conduct rhythm and playing tests at 80 bpm or slower for full credit. Offer extra credit for faster tempi.
- Provide assistance and constant reminders on how to organize musical materials.
- Change the counting system or use a combination of systems. Use what works best for the individual student.
- Praise good behavior and effort consistently so students will understand what to replicate in the future. Positivity is important for students with ADHD and/or dyslexia because of their extreme desire to please and “fit in.”

All of this information is overwhelming. How do I start remediating and accommodating students with ADHD and/or dyslexia?

- Begin by speaking with or sending a quick email to the counselors, special educators, and IEP/504 team coordinators. Ask for their suggestions.
- If possible, acquire a class set of helpful materials before the beginning of the school year (see below).
- Familiarize yourself with a few assistive technologies.
- Put together binders or electronic files with information about the conditions along with this reference guide.
- Attend an IEP/ARD and/or 504 meeting to learn about the process.
- Investigate the incoming beginner class rolls to gauge the number of students who may need assistance.
- Open a dialogue as soon as possible with the parents to inform them of the individual needs that their child may require.

As a band director, my time is limited. How much time do I need to devote to remediating and accommodating for students with ADHD and/or dyslexia, and will spending extra time on these students hold back the rest of the class?

- While time is limited, many accommodations and remediation techniques take little to no time to implement.
- Have a class set of the following items to instantly utilize as needed:
 - Colored overlays
 - Vibrating/pulse metronomes
 - Fidget toys
 - Chair exercise bands
 - Colored pencils and highlighters
 - Stickers
 - Posters with key musical words or picture reminders
- Spend one extra minute doing repetitions of an exercise and reviewing that exercise for the next several days. The extra minute will help everyone in the class, but especially those with ADHD and/or dyslexia.
- While it will take some time, the following accommodations and remediation techniques will help the entire class (not just those with disabilities) and take little time to implement. Doing some prep work before class will improve speed of implementation.
 - Large font printing of handouts and music.
 - Kinesthetic games (note name and touch the symbol).
 - Create a poster with word rhythms.
 - Develop concise, instructional practice logs.
 - Use multisensory and multimodal techniques as often as possible.
 - Eliminate split parts (divisi) with computer software or whiteout whenever possible.
- Other techniques may be more involved or individualized, however, most of the above techniques should quickly improve the overall classroom experience for almost everyone in the class.

Is there other information I need to know?

- Neurodevelopmental disorders affect similar parts of the brain. Symptoms of ADHD and SLD commonly overlap.
- Be aware of the possibility of musical symptoms emerging from multiple categories in spite of a specific diagnosis.
- Students with ADHD and/or dyslexia are resourceful. Encourage them to come up with their own solutions.
- Remember that many of the greatest individuals in history e.g., Steve Jobs, Albert Einstein, John Lennon, Harry Belafonte, Michael Phelps, have had ADHD and/or dyslexia.
- We should strive to inspire students with these conditions, as they have unlimited potential.

- See reference page for more resources.
- See companion DMA document for detailed bibliography and citations.

Quick Reference Chart

Diagnosis in 504 Plan or IEP	Music Classroom Issues	Remediation, Accommodation, and/or Modification
Dyslexia	Pulse	<ul style="list-style-type: none"> • Vibrating metronome • Eurhythmics • Tapping or rocking the student • Testing at < 80 bpm • Do not grade foot tapping
	Note Reading and Symbols	<ul style="list-style-type: none"> • Colored overlays or paper • Large font • Kinesthetic games (note name/touch the symbol) • Teacher does NOT sing note names (to avoid memorization) • Colored note heads, note heads with letters inside • Mnemonic devices • No testing of foreign terms, use word banks • Testing at < 80 bpm • Use whiteout or rewrite parts that contain split parts (divisi).
	Rhythm	<ul style="list-style-type: none"> • Variety of counting systems • Word rhythms • Testing at < 80 bpm • Flash cards, games
	Left vs. Right	<ul style="list-style-type: none"> • Hand L vs. Hand not L • Touch or point to “this hand” • Colored stickers for right vs. left hand • Mnemonic devices
	Anxiety	<ul style="list-style-type: none"> • Private graded testing • Avoid student reading aloud • Clear expectations and daily syllabus • Peer assistance
	Sight-reading	<ul style="list-style-type: none"> • Perform a memorized passage instead • Reduce multitasking—focus on one main aspect during sight-reading • Testing at < 80 bpm • Extra time to mentally prepare
ADHD	Focus and Attention	<ul style="list-style-type: none"> • Colored overlays or paper • Key word for focus • Multisensory techniques • Highlighters • Minimize classroom distractions and adjust seating
	Hyperactive	<ul style="list-style-type: none"> • Fidget toys • Chair exercise bands • Stretch and errand break
	Anxiety	<ul style="list-style-type: none"> • Positive reinforcement • Tokens for achievement • Quiet, separate testing room
	Sight-reading	<ul style="list-style-type: none"> • Provide commentary before playing • Extra time to organize and mentally prepare • Practice the skill often!

Executive Dysfunction	Organization	<ul style="list-style-type: none"> • 5 minutes per week on organization (binder and materials) • Allow pictures or audio recording of instructions and assignments
	Staying on Task, Switching Tasks	<ul style="list-style-type: none"> • Allow short, regular class breaks • Stretch and errand break • Key word for new task
	Practicing Habits	<ul style="list-style-type: none"> • Give detailed written and oral practice instruction • Practice charts and handouts • Practice demonstrations
Dysphasia, Apraxia	Slow Answers or No Answers	<ul style="list-style-type: none"> • Allow for extra thinking time • Word bank on the board • Prompt questions ahead of time
Dysgraphia	Handwriting	<ul style="list-style-type: none"> • Assistive technology like Finale • Word processing • Do not penalize poor spelling
Dyspraxia	Small Coordination and Fingerings	<ul style="list-style-type: none"> • Small coordination exercises • More repetitions of patterns • Testing at < 80 bpm
	Large Coordination and Posture	<ul style="list-style-type: none"> • Eurhythmics • Stretching and coordination exercises • Do not grade foot tapping
Auditory Processing Problems	Oral instruction	<ul style="list-style-type: none"> • Create handouts • Allow recording devices • Draw concepts on board • Write instructions on board
	Rhythm	<ul style="list-style-type: none"> • Word rhythms, pictures
	Pulse	<ul style="list-style-type: none"> • Vibrating metronome • Eurhythmics • Do not grade foot tapping • Testing at < 80 bpm
Visual Processing Problems	Note Reading and Symbols	<ul style="list-style-type: none"> • Colored overlays or paper • Large font • Kinesthetic games (note name and touch the symbol) • Colored note heads, note heads with letters inside • Mnemonic devices • Testing at < 80 bpm • Use whiteout or rewrite parts that contain split parts
	Rhythm	<ul style="list-style-type: none"> • Word rhythms • Group rhythms with colors and/or shapes • Testing at < 80 bpm
	Written Instruction	<ul style="list-style-type: none"> • Create handouts with pictures • Allow picture taking of assignments and instructions
Dyscalculia	Rhythm and Symbol Decoding	<ul style="list-style-type: none"> • Word rhythms • Colored pencils • Maps, charts, drawings of concepts • Computer practice • Peer assistance

Dear _____ (504 Coordinator, ARD Chair, Counselor, Special Educator),

I hope you are gearing up for a wonderful school year. I have just received my class rolls for the upcoming school year and see that I have ___ 6th grade students with a ___ plan. Because I believe it's important that all students are included and succeed in music class, I would like some advice on how to adapt for students with disabilities in my classroom. I would be happy to schedule a meeting with you, after the reviews of all the 504 plans and IEPs take place, to go over each student's needs. I am including a chart with musical expectations or goals that I would like each student to achieve in his/her beginning band year, and ask for your assistance on any accommodations or modifications that I can provide.

I look forward to joining with you in this process to help every student succeed in music.

Sincerely yours,
Band Director

Student's Name _____

Musical Expectations	Achievable?		Accommodation/Modification
Read appropriate music staff	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Play ___ scales	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Count rhythms including: whole, half, quarter, eighth, _____	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Tap foot in time with metronome	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Demonstrate correct posture	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Demonstrate a characteristic tone	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Describe musical information	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Identify musical symbols	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Demonstrate appropriate care and maintenance for their instrument	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Sight-read	<input type="checkbox"/> Y	<input type="checkbox"/> N	

Behavioral Expectations			
Quietly raise their hand to answer or ask questions	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Stay focused on tasks	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Allow others in the class to participate	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Fidgeting kept to a minimum	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Remain quiet when others are performing	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Understand that I will give equal attention to all members of the class	<input type="checkbox"/> Y	<input type="checkbox"/> N	
Avoid negative language in front of peers in the classroom	<input type="checkbox"/> Y	<input type="checkbox"/> N	

Dear _____ (Parent)

I am excited to teach _____ in my beginner band class this year. It has come to my attention that _____ has a _____ plan for _____. I want to touch base with you about how the condition might affect (him/her) in the music classroom. While not every student with the condition struggles in a music class, some students need some individual attention, accommodations and/or extra materials that can assist in the learning process. Here is a list of items that I have used in the past that might benefit (him/her) at home:

- Colored overlays
- Vibrating pulse metronome or app
- Fidget toy
- Exercise bands to put around chair legs for restless legs/feet
- Colored pencils and highlighters
- Smart phone, tablet, or other recording device for recording lesson or assignment

On the back of this letter is a brief questionnaire. It would help me if you can complete this questionnaire to give me more insight into (his/her) condition.

I look forward to getting to know and working with _____.

Sincerely,
Band Director

Name _____ Date _____

When was your child diagnosed with the condition? _____

Has your child received remediation in the past? If yes, explain.

Is your child currently receiving treatment that is working? If yes, explain.

Does your child struggle in a specific course or other aspects of life? If yes, explain.

Other than elementary music class, has your child played an instrument before? If yes, were they successful or did they struggle with any aspects?

Does your child suffer from anxiety, especially when called on in class to speak individually? If yes, explain.

Is there anything else you would like me to know?

Reference Page

Dyslexia:

The International Dyslexia Association (IDA)

An international organization dedicated to the treatment and study of dyslexia.

www.interdys.org

American Dyslexia Association

Free printable worksheets, apps, and resources.

www.american-dyslexia-association.com

Dyslexia Daily

Free worksheets, videos, blog, and resources.

www.dyslexiadaily.com

Learning Ally

Library of over 80,000 audiobooks for students and adults with reading-related learning disabilities and visual impairments.

www.learningally.com

LD Resources

Collection of resources on various aspects of learning disabilities and community blog posts.

www.ldresources.com

Learning Disabled Online

Resource for parents and teachers including articles, learning store, forums, newsletters, etc.

<http://www.ldonline.org>

Irlen Institute

Services and tools for children and adults with visual processing problems, including those identified with reading and learning difficulties and ADHD.

www.irlen.com

ADHD:

ADDitude

Support for ADHD and LD

www.additudemag.com

ADDA

Attention Deficit Disorder Association
Materials and services to help people with ADHD.

www.add.org

CHADD

Resource for children and adults with ADHD.

www.chadd.org

A.D.D. WareHouse

Books and resources for treatment of developmental disorders including ADHD and related disorders.

www.addwarehouse.com

Disability:

Wrights Law USA

Resource for understanding legal special education rights.

www.wrightslaw.com

U.S. Department of Education and Individuals with Disabilities Education Act (IDEA)

Law that governs how states and public agencies provide services to children with disabilities.

www.idea.ed.gov

Section 504 of the Rehabilitation Act of 1973

United States Department of Labor

www.dol.gov/oasam/regs/statutes/sec504.htm

Americans with Disabilities Act (ADA)

United States Department of Justice Civil Rights Division. Information and technical Assistance on the Americans with Disabilities Act.

www.ada.gov

Center for Parent Information and Resources (CPIR)

Resources to help families with children with disabilities, funded by the Office of Special Education Programs (OSEP) at the U.S. Department of Education.

www.parentcenterhub.org

Texas teaching information:

Texas Essential Knowledge and Skills (TEKS)

State curriculum standards for Texas public schools K-12.

www.tea.texas.gov/index

Texas Education Agency (TEA)

Info about curriculum standards, laws, special education resources, instructional materials, programs and services, parent and family resources, college and career readiness.

www.tea.texas.gov

Texas Music Educators Association (TMEA)

Information about music education in the law, teaching resources, music education advocacy, and mentoring.

www.tmea.org

Books:

Music and Dyslexia A Positive Approach
edited by T.R. Miles, John Westcombe and Diana Ditchfield.

Instrumental Music for Dyslexics A Teaching Handbook by Sheila Oglethorpe.

Assistive Resources:

Snap Type

App in iTunes for occupational therapy support and handwriting problems.
itunes.apple.com/us/app/snaptypes-for-occupational/

SmartMusic

Interactive music learning software that allows students to record and play with accompaniments.
www.smartmusic.com

GarageBand

Music recording and editing program that allows students to record assignments in their home environment and submit online for a grade.
www.apple.com/mac/garageband/

Finale

Music composition program with playback that allows students to complete written notational assignments without the need for proper penmanship.
www.finalemusic.com

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