MUSIC THERAPY: EFFECTS ON CHILDREN DIAGNOSED WITH ASD

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ABSTRACT

This study was conducted to focus on the use of music therapy as a treatment to serve people of special needs, including individuals with ASD. The research seeks to inform parents/students of children with ASD that music therapy could be the avenue in which their children/students are treated in certain areas. The information in this research can assist parents with the knowledge and understanding they need relating to music therapy in order for their child to overcome weaknesses associated with ASD. Similarly, music teachers can gain further insight into the world of music therapy to encourage students who struggle in music class to become involved in music therapy sessions. During this study, scholarly sources were used to show general information about music therapy and autism. In addition, findings from peer reviewed studies were used to exhibit the power of music therapy in a child with ASD's life. The overarching aim of this study is to define, describe and demonstrate the significance music therapy can bring to a child with ASD.

Keywords: Music Therapy, Autism, Neurological (Neurology), Cognitive, and Social.

Chapter 1: Introduction

In recent years, observations have been made that proclaim that children with ASD respond to music in a positive way, possibly more so than other things; therefore, it is important for music therapy to continue to be studied by music educators. Studies have shown that children with ASD respond to music differently from others because it allows them to work on skills such as movement and interaction, which otherwise would be difficult for them to accomplish.[1] If more children on the autism spectrum were given the opportunity to study music on a regular basis, they could be helped socially, mentally and physically. Research has found that music therapy is a successful means by which children with ASD overcome certain obstacles they face in their lives.[2] This research is crucial for children with ASD who struggle to express themselves and make sense of the world around them.

Background

For decades, scholars and scientists have clung to differing views concerning the effectiveness of music therapy procedures on children with ASD. Some hold to the view that music does not affect children with ASD any differently than other children, while some believe that children with ASD do respond to music in an unique way and can benefit from it. Rory Allen and Pamela Heaton explain that some people even proclaim that children with ASD will not respond to music at all, let alone profit from it. These authors believe that children with ASD do not respond well to music because it involves social interaction. However, others refute this notion by pointing out that a diverse number of children with ASD show exceptional talent and

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[1] American Music Therapy Association. (2016). Retrieved, May 31st, 2018 from http://www.musictherapy.org/.

[2] Ibid.

growth when they are introduced to music.[3] Similarly, Jinah Kim, Tony Wigram and Christian Gold indicate that music therapy serves children with ASD at their "level and interest" which leads them to become more involved in the process of music making. These authors further explain that because music therapy promotes engagement, children with ASD often excel at this art more than other activities or skills.[4]

Problem Statement

Many educators and parents may not realize how effective music can be to children with ASD. The importance of this research lies in the fact that many individuals with ASD could thrive at music if given the proper teaching. If music therapy classes were offered more frequently in schools, private studios etc., a wider population of children could benefit by what it has to offer. Additionally, if teachers were properly educated about the advantages of children with ASD making music within the values and principles espoused by music therapy, they could point them in the direction of a certified music therapist. Parents of children with ASD may be unaware that music offers significant benefits to their children. A majority of people believe that children with ASD do not respond to music in a positive way.[5] This research serves to examine the notion that music-making affects children with ASD and is capable of addressing certain limitations which are caused by ASD. If parents are educated about these facts, more and more of the population of children with ASD could be helped.

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[3] Allen, Rory and Pamela Hinton, "Autism, Music, and the Therapeutic Potential of Music in Alexithymia" *Music Potential,* 27, no. 4 (April 2010): 251, accessed June 1, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/753579189?pq-origsite=summon&accountid=12085.

[4] Kim, Jinah, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," *Journal of Autism and Developmental Disorders,* (2008): 1758, accessed June 4, 2018, https://link-springer-com.ezproxy.liberty.edu/content/pdf/10.1007%2Fs10803-008-0566-6.pdf.

[5] Ibid.

Purpose

The purpose of this project is to survey the discipline of music therapy, describing how and why it affects the minds of children with ASD within the practice of music-making. This paper should clearly show the science and correlation of music therapy and individuals with ASD. By reading this project, others should begin to understand that music therapy can help children with ASD communicate more freely, overcome physical boundaries and strengthen the way their minds relate to situations around them. This research will show that music moves beyond pleasure and meets needs in children with ASD which may otherwise not be met. Even though people with ASD are challenged in certain societal arenas, this study shows that they are capable of relating to music in a way that is pleasurable and prosperous for their physical and intellectual growth.[6]

Significance

The researcher's observation that music could calm and engage a particular child dealing with ASD motivated her in many ways that initiated the research arenas covered in this paper. The researcher recognized that the child had extreme difficulties conversing and engaging with others as well as staying still and focused on certain tasks. Through the observation of this child, the researcher could attest to the claim that children who are on the autistic spectrum struggle with fitting in and often feel "shut off" from the outside world.[7] Due to the time spent with the individual with ASD, the researcher desired to analyze whether or not music was an avenue through which children diagnosed with ASD are benefited. Because of the perception that music

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[6] Graham, Gordan, "Music and Autism," *Journal of Aesthetic Education,* 35, no. 2 (2001): 39, accessed June 1, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/220649027?pq-origsite=summon&accountid=12085.

[7] Ibid.

therapy could help children in a multitude of ways, the researcher wanted to examine the relationship between music-making and children with ASD to further help them in the future.

Research Questions

In order to successfully address the notion that music therapy is an avenue which can assist children with ASD in various ways, the purpose of music therapy must be discussed. Therefore, the first foundational question asked in preparation for this study was: "Why is music therapy important specifically relating to children with ASD?" Studies testify that music therapy is "effective for improving communication, interpersonal skills, personal responsibility, and play."[8] Music also reinforces skills related to the five senses such as listening and looking. Furthermore, during the music making process, the emotions of children with ASD can intensify, allowing them to experience sensations and feelings as other children do.[9]

The next research question was: "Do children with ASD respond to music making in a positive way?" Addressing this question will build upon the importance of music therapy discussed in question one. The final research question asked in this study was: "In what ways does music making benefit children with ASD?" Without stating particular ways music can aid autism, the frame work for this research would not be well-established.

Definition of Terms

There are certain terms which need to be defined in order to thoroughly understand the research which took place in this study. The first of these terms is *music therapy.* Music therapy is considered part of the medical profession because it uses music as a way to treat people, whether it be in the physical realm or beyond. In the same way that doctors prescribe medicine to

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[8] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)," *American Music Therapy Association*, (2016), accessed June 2, 2018, http://www.musictherapy.org/.

[9] Ibid.

patients in need, a music therapist prescribes certain exercises/activities to their patients once they assess their particular situation. Music therapists are certified individuals who at least hold a bachelor's degree in music therapy. A music therapy degree involves the study of psychology, medicine and music combined.[10] Music therapy is a branch of music and medicine that impacts many different areas of human need and can be used on patients of various ages and circumstances. The extensive possibilities of music therapy have allowed it to be recognized, more and more, as a prosperous and thriving branch of music.[11] Throughout the years, music therapy has served to assist people with "physical, emotional, cognitive, and social needs."[12]

The next term to define is *Autism,* also known as ASD. This is a neurological disorder affecting the social involvement and communication of individuals. Autism is under a group of disorders known as PDD, or Persuasive Developmental Disorder. The main characteristics of ASD are difficulties in general socialization contexts, the lack of ability to converse with others fluently and delays in understanding social cues. Some cases of autism also result in additional speech impairments and physical ailments.[13] Author Gordon Graham describes individuals with ASD as follows:

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[10] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)."

[11] Shakarashvili, Marina,"Music Therapy," *European Scientific Journal,* 2 (December 2015): 244, accessed June 1, 2018, 2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info%3Asid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=article&rft.atitle=MUSIC+THERAPY&rft.jtitle=European+Scientific+Journal&rft.au=Shakarashvili%2C+Marina&rft.au=Arabuli&rft.date=2015-12-01&rft.issn=1857-7881&rft.eissn=1857-7431.

[12] Ibid.

[13] Volkmar, Fred R., and David Pauls, "Autism," *The Lancet,* 362 (October 4, 2003): 1133, http://web.a.ebscohost.com.ezproxy.liberty.edu/ehost/detail/detail?vid=1&sid=52675592-f1bf-455c863e2ee516d1d7a6%40sessionmgr4006&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=14550703&db=mnh.

> It seems that both intellectually and emotionally, they are incapable, in varying degrees, of initiating and sustaining the sort of social, linguistic, and physical contact that is among the commonest features of ordinary human relationships and at the same time essential to them.[14]

Autism is a significant disorder - as of 2014, it affects one in sixty-eight children in the United States, according to the Center of Disease Control.[15] ASD is a serious syndrome that requires special attention in order to benefit children who live with this condition.

Another important term to keep in consideration is *neurology;* the "structure, function, and diseases of the nervous system."[16] Since this research will discuss the neurological side of autism as relating to music, this term is crucial for this study. In an article on autism, Fred R. Volkmar and David Pauls describe autism as being a "neuropsychiatric disorder."[17] In order to understand autism to its fullest, it is needful to grasp what neurology is and how it connects to children with ASD.

The next significant term in this study is *cognitive;* "conscious intellectual activity (such as thinking, reasoning, or remembering)."[18] One area with which music therapy can help children

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[14] Graham, Gordan, "Music and Autism," 39.

[15] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," *Music Educators Journal,* 104, no. 2, (December 2017): 21, accessed June 2, 2018, http://rx9vh3hy4r.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info%3Asid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=article&rft.atitle=Understanding+the+Mind+of+a+Student+with+Autism+in+Music+Class&rft.jtitle=Music+Educators+Journal&rft.au=Hourigan+Ryan+M&rft.au=Hammel+Alice+M&rft.date=2017-12-01&rft.pub=National+Association+for+Music+Education&rft.issn=0027-4321&rft.eissn=1945-0087&rft.volume=104&rft.issue=2&rft.spage=21&rft.epage=26&rft_id=info:doi/10.1177%2F0027432117732386.

[16] "Neurology," *Merriam-Webster,* (2018), accessed June 2, 2018, https://www.merriam-webster.com/dictionary/neurology.

[17] Volkmar, Fred R., and David Pauls, "Autism," 1133.

[18] "Cognitive," *Merriam-Webster,* (2018), accessed June 2, 2018,

with ASD is called "cognitive processing." Children living with ASD often have difficulty processing conversations, instructions, ideas etc.[19] Music therapy seeks to strengthen a child with ASD'S cognitive behavior through musical interaction. [20]

Another term which will often be used in this research is *social skills.* This is a major aspect of a child with ASD's life which is affected because of autism. When this research uses the term social skills, it refers to "relating to human society, the interaction of the individual and the group, or the welfare of human beings as members of society."[21] It is imperative to notice that this definition includes how people relate to society as a whole in addition to individual relationships. One of the battles children with ASD face on a daily basis is the struggle to communicate and socialize with others around them. The main hindrance in social skills for a child with ASD is verbal communication. Thus, children with ASD often have trouble processing verbal cues and commands from others; presenting major challenges in social skills.[22] This research will address the challenges children with ASD face due to delays in verbal communication; discussing how music therapy can improve this aspect of social skills amongst children with ASD.

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https://www.merriam-webster.com/dictionary/cognitive.

[19] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind Of a Student with Autism in Music class," 19.

[20] Ibid., 25.

[21] "Social," *Merriam-Webster*, (2018), accessed June 2, 2018, https://www.merriam-webster.com/dictionary/social.

[22] Volkmar, Fred R., and David Pauls, "Autism," 1133.

Chapter 2: Literature Review

The aim of this research is to discover the effects of music therapy on children with ASD. The literature was reviewed to show how children with ASD respond to music, the method of music therapy, and the most obvious ways children with ASD are benefited by music-making.

The Response of Autistic Children to Music

Rory Allen et al, authors of the article "The Effects of Autism and Alexithymia on Physiological and Verbal Responsiveness to Music," sought to examine the response of children with ASD compared to other children who do not suffer with special needs. This study observed the way children with ASD listened and responded to music to which they were accustomed. Furthermore, this study also had children without special needs listen to exactly the same music as the children with ASD. Allen and Associates claimed that the children with ASD's responses were not different than the other children's responses. However, these authors also pointed out that the emotional response to music often contrasts between children with ASD as compared to children without ASD. According to these authors, children with ASD exhibit the same outcome as other children when they listen to music but the way they process and express themselves musically contrasts from others.[23]

Gordon Graham expounds on this question of whether children with ASD respond well to music by revealing that children with ASD often excel at certain talents, music being one of them. On this subject, Graham stated that "many of these exhibit prodigious mathematical abilities-working out complicated multiplications at a moment's notice or computing dates in distant calendars. Others have a striking ability to produce drawings of astonishing accuracy

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[23] Allen, Rory, et al., "The Effects of Autism and Alexithymia on Physiological and Verbal Responsiveness to Music," 432.

after, it seems only momentary observation."[24] Graham stated that there have been many times when children with ASD have been exceptionally gifted at music, sometimes more so than children without ASD. However, Graham showed that this is not always the case. While there are times where children with ASD do not respond as well as other children, the reality still remains that these individuals often have a special connection with music.[25]

The authors of *American Music Therapy Association* hold to the belief that all people are impacted by music in some way on a daily basis. These authors state that "researchers have discussed advanced music memory, responsiveness, and aptitudes within this population; more recent studies show that individuals with ASD may have a heightened musical aptitude and sensitivity to musical elements, yet similar skills of music perception as compared to typically developing peers."[26] Even though some children with ASD may not shine at music-making, they can all learn and benefit from the process. This source points to multiple studies which show that children with ASD respond well to music, showing that music moves in the lives of multiple different types of people, including individuals with ASD.[27]

Motor Skills and Physical Coordination

One of the areas in which music can help autistic children in is physical engagement/activity. The authors of the article "Increasing Physical Activity in Children with Autism Through Music, Prompting and Monitoring" show that children with ASD have weaknesses with "gross motor skills (GM) and coordination" which is why it can be very difficult for them to exercise or engage in physical activity. Dieringer et al. showed that children with ASD often miss out on physical activities because it is hard for them to participate with

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[24] Graham, Gordan, "Music and Autism," 39.
[25] Ibid.
[26] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)."
[27] Ibid.

other children. Studies have shown that due to these reasons, children with ASD are often inactive and receive little exercise throughout their lives.[28]

Shannon Titus Dieringer et al. stated that studies show that incorporating various movements into music will help children with ASD express themselves physically. These movements include "running, kicking, throwing and jumping jacks." Dieringer et al. conducted an experiment of their own in which they compared two types of teaching methods. One of the teachers taught a song simply by leading the students through the words. In contrast, the second teacher taught the words accompanied by motions, movements and "teacher modeling." The outcome of this experiment shows that the children with ASD responded better with the second teacher. The study shows that children with ASD focused more intently while they were engaged in music and movement all at once. Each of the children in this project reacted in a unique way; however, they each participated by moving their bodies, even if they could not sing due to the causes of ASD.[29]

The Dieringer et al. study showed that physical activity through music can strengthen a child with ASD's gross motor skills. Out of the seven participants in this study, four of the children had a positive response immediately after engaging in music and movement at the same

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[28] Dieringer, Shannon Titus, et al., "Increasing Physical Activity in Children with Autism Through Music Prompting, And Modeling," *Psychology in the Schools,* 54, No. 4 (2017): 422, accessed June 7, 2018, http://rx9vh3hy4r.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info%3Asid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=article&rft.atitle=Increasing+Physical+Activity+in+Children+with+Autism+through+Music%2C+Prompting%2C+and+Modeling&rft.jtitle=Psychology+in+the+Schools&rft.au=Dieringer%2C+Shannon+Titus&rft.au=ZoderMartell%2C+Kimberly&rft.au=Porretta%2C+David+L&rft.au=Bricker%2C+Angela&rft.date=2017-04-01&rft.pub=Wiley-Blackwell&rft.issn=0033-3085&rft.eissn=1520-6807&rft.volume=54&rft.issue=4&rft.spage=421&rft.externalDocID=EJ1132762.

[29] Ibid.

time. The other children had gradual responses, but all of them showed growth and improvement once music and physical movement were applied together. When the music was simply listened to by the children, they were unfocused and withdrawn. However, when they were invited to be a part of the music through physical activity and singing, they showed exceptional results.[30] This study found that participatory music events may have the power to engage children with ASD, allowing them to interact with physical engagement which may otherwise be very difficult for them to do.

Michelle W. Hardy and A. Blythe LaGasse stated that in addition to social and mental defects, many children with ASD also have trouble with movement, due to their motor skills. These authors explain that this part of autism is often overlooked, leaving children with ASD with weakened motor abilities. In the article "Rhythm, movement, and autism: using rhythmic rehabilitation research as a model for autism," Hardy and LaGasse showed how autistic children can be greatly benefited physically through music. These authors sought to inform people that music has power to heal a part of ASD other than social communication and interaction.[31]

Hardy and LaGasse explained that the basis of all music falls on rhythm. Because of this truth, rhythm plays a huge role in the musical experience of a child with ASD. Rhythm is such a powerful attribute of music that it "activates motor areas of the brain including the pre-motor cortex, supplementary motor areas, pre-supplementary motor area, and the lateral cerebellum."[32]

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[30] Dieringer, Shannon Titus, et al., "Increasing Physical Activity in Children with Autism Through Music Prompting, And Modeling," 423.

[31] Hardy, Michelle W., and A. Blythe LaGasse, "Rhythm, Movement, and autism: using Rhythmic rehabilitation research as a model for autism," Frontiers in Integrative Neuroscience, (March 28, 2013): 1, June 8, 2018, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3610079/pdf/fnint-07-00019.pdf.

[32] Ibid., 2.

Through the process of playing/singing, children with ASD can strengthen the part of the brain responsible for motor function. Hardy and LaGasse stated that the relationship between rhythm and motor function has been scientifically tested and has shown positive results.[33]

Rhythm has the power to cause the motor cortex to respond so that the body moves and acts in a way which before was not possible. It is for this reason that "interaction between auditory rhythm and motor responses can be effectively employed for rehabilitation in movement disorders." Because of the connection between rhythm and motor ability, children with ASD can improve physically by moving in natural ways which their bodies will lead them to do through music.[34]

Social Improvement

One of the overarching symptoms of autism is the difficulty of communication and interacting with others.[35] However, communication is an essential part of life for every individual. Michael J. Silverman stated that "humans are social beings who thrive in communication with one another."[36] Even though some are better at communication than others,

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[33] Hardy, Michelle W., and A. Blythe LaGasse, "Rhythm, Movement, and autism: using Rhythmic rehabilitation research as a model for autism," 2.

[34] Ibid.

[35] Volkmar, Fred R., and David Pauls, "Autism," 1133.

[36] Silverman, Michael J., "Nonverbal Communication, Music Therapy and Autism: A Review of Literature and Case Example," *Journal of Creativity in Mental Health,* 3, No. 1, (2008): 5, Accessed June 2, 2018, http://rx9vh3hy4r.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info%3Asid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=article&rft.atitle=Nonverbal+Communication%2C+Music+Therapy%2C+and+Autism%3A+A+Review+of+Literature+and+Case+Example&rft.jtitle=Journal+of+Creativity+in+Mental+Health&rft.au=Silverman%2C+Michael+J&rft.date=2008-05-27&rft.issn=1540-1383&rft.eissn=1540-1391&rft.volume=3&rft.issue=1&rft.spage=3&rft.epage=19&rft_id=info:doi/10.1080%2F15401380801995068&rft.externalDBID=n%2Fa&rft.externalDocID=10_1080_15401380801995068&paramdict=en-US.

every human being could greatly benefit from successful communication. One of the strengths of music therapy is that it can effectively help children with ASD communicate with each other and others with whom they come in contact.[37]

In the article "Nonverbal communication, Music Therapy, and Autism: A Review of Literature and Case Example," Michael J. Silverman explained that one way in which music therapy helps people with special needs communicate is through "nonverbal communication."[38] Nonverbal communication includes various types of cues which do not rely on the voice. Silverman stated that "facial expressions, eye contact, pupil dilation, distance, attire, vocal features, movements, posturing, smell and use of space" are characteristics of nonverbal communication.[39] This type of communicating is learned naturally and does not require a great deal of thought or consideration. Silverman cited that this type of communication is widely used and accepted as an alternative to vocal communication. Nonverbal communication can play a significant role in music therapy in many different ways. One of these is that the music therapist can start a healthy relationship with the student/client initially. Studies have found that at times nonverbal communication can expose more about an individual than words can. In order to receive positive results, a music therapist should show forth clear nonverbal communication, allowing the student to reciprocate.[40]

Throughout the years, music has continued to be a form of nonverbal communication which allows people to express themselves without using words. Music is powerful enough to

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[37] Silverman, Michael J., "Nonverbal Communication, Music Therapy and Autism: A Review of Literature and Case Example," 5.
[38] Ibid.
[39] Ibid.
[40] Ibid.

"transmit information, emotional messages, needs, and values."[41] Silverman found that music can be thought of as a type of "language," due to how it can serve as a way of interaction amongst people.[42] Silverman explained that children with ASD normally respond well to communicating nonverbally through music because it is often quite pleasurable for the patient. Through music therapy, a child with ASD can receive an urging to communicate, which can then grow into a process of learning to communicate nonverbally.[43]

In addition to nonverbal communication, music can improve a child with ASD's verbal communication as well. Thenille Braun Janzen and Michael H. Thaut explained that the Broca's area, a part of the frontal lobe of the brain, is often underdeveloped in children with ASD. However, theses authors continue to point out that music can stimulate the Broca's area, causing a child with ASD to strengthen their communication skills. Music is especially beneficial to this part of the brain when the individual is actually taking part in the music, not simply listening.[44]

One form of music which can assist speech improvement in a child with ASD is singing. Authors of the article "The Therapeutic Effects of Singing in Neurological Disorders" focused on whether singing can assist a child with ASD in ways which speaking cannot. Catherine W. Yan et al. found that when people with ASD sing, it "engages a bilateral front-temporal network more prominently than speaking does, and this network contains some components of the mirror neuron system."[45]

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[41] Silverman, Michael J., "Nonverbal Communication, Music Therapy and Autism: A Review of Literature and Case Example," 7.
[42] Ibid.
[43] Ibid., 10.
[44] Janzen, Thenille Braun and Michael H. Thaut, "Rethinking the role of music in the neurodevelopment of autism spectrum disorder," *SAGE,* 1 (2018): 2, accessed June 1, 2018, http://journals.sagepub.com/doi/abs/10.1177/2059204318769639q.
[45] Yan, Catherine W., et al., "The Therapeutic Effects of Singing in Neurological Disorders,"

Authors Kate Simpson and Deb Keen found that music-making can enhance a child with ASD's sociability because the mind reacts to "auditory" stimuli more than regular stimuli. These authors conducted a case study involving children diagnosed with ASD ranging from birth to eighteen years. The results of this study concluded that music showed rewarding results concerning social interactions of children with ASD. This study was conducted by the examiners testing out various emotions of children with ASD depending on the type of instruction given. During this examination, the children were tested through four different means:

> No contact control; contact control where verbal instructions accompanied visuals; background music utilizing pre-recorded improvised music designed to reflect emotion and verbal instructions; and song texts using specifically composed songs about the emotion; was used.[46]

The children showed the best results when they were introduced to the music. They were able to respond and communicate with their teachers more comfortably once they were engaged through music.[47]

Another study examined the way children with ASD interacted with their peers in an outdoor setting. In this study, the teachers first allowed the children to interact with each other outdoors (on playgrounds, picnic areas etc.) without any musical instruction. Following the first scenario, the teachers then freely led the children in group songs. The investigators of this study observed that once the children began to be a part of the music, they gradually started to interact with one another. Simpson and Keen explained that the children responded well in this

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Music Perception, 27, No. 4 (April 2010): 292, accessed June 19, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/753538375?pq-origsite=summon&accountid=12085.

[46] Simpson, Kate, and Deb Keen, "Music Interventions for Children with Autism: Narrative Review of the Literature," *Journal of Autism and Developmental Disorders,* 41, No. 11 (November 2011): 1510, accessed June 4, 2018, https://link-springer-com.ezproxy.liberty.edu/article/10.1007%2Fs10803-010-1172-y.

[47] Ibid.

experiment because they would model what the teachers were doing musically. Once the students successfully followed the teacher's commands, they began to notice their classmates performing the same actions which encouraged them to continue in the music making process.[48] This study is an example of how music therapy can be paired with normal activities, such as recess/playtime and be used to benefit a child with ASD's social needs.

One study was conducted to see if music increases social ability in children with ASD by comparing children's play time to music making. In this study, Kim et al. observed that the children with ASD struggled to play with their peers during the free play time. Whereas, once the teachers began to play instruments (allowing the students to play the instruments as well) and lead them in musical engagement, the children showed increasing improvement in their communication skills. Kim et al. explained that during the music part of this experiment, the children established and maintained eye contact and gave the teacher their full attention. In addition, the study showed that the children responded in some way to the music making process but failed to do so during play time. The children's ability to interact at some level greatly improved when the teachers brought music into the classroom.[49]

Another study observed by Simpson and Keen consisted of two three-year-olds diagnosed with ASD who were led to sing about their morning routines. The teachers composed a song for each child which expressed to the child what needed to be done. The results of this study show that the children were able to complete simple tasks and communicate to their teachers when they needed assistance.[50]

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[48] Simpson, Kate, and Deb Keen, "Music Interventions for Children with Autism: Narrative Review of the Literature," 1510.
[49] Ibid., 1510-1511.
[50] Ibid.

Kim, Wigram and Gold (2008) tested the effects of music therapy on fifteen preschoolers with ASD. In this study, each child had a thirty minute music therapy lesson each week - for three months. During these sessions, the children were broken into two groups. The first group experienced music therapy first followed by free time. The second group had free time first followed by a period of music therapy. In both groups, the music therapy sessions increased the child's attention span, eye contact and ability to interact and share with other classmates. The children who finished their music therapy session first were able to focus for a longer period of time during their play time with the other children. Similarly, the children were able to maintain eye contact for a significantly longer time during the music making process rather than in free time. Kim observed that the children with ASD were more likely to share and cooperate more willingly with each other during the music session compared to playtime.[51]

Hourigan and Hammel (2017) showed how children with ASD can be helped socially through music. These authors challenge music educators to carefully introduce the piece of music they will be working on in the class, especially for students with ASD. Children with ASD do not easily understand jokes, social cues or inferences. Therefore, the more clear the instructions and details are about a piece of music, the more a child with ASD will benefit from the class. Hourigan and Hammel found that when children with ASD can understand a song they are singing/playing, they are more likely to socialize and interact with others in the class who are also engaging in music.[52]

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[51] Kim, Jinah, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," 1763.

[52] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 25.

Another way children with ASD can improve socially is through musical activities which require multiple actions at the same time. Hourigan and Hammel explained that children with ASD have a difficult time processing more than one action at a time. When interacting with others, individuals often establish eye contact, speak and process what is going on in the conversation. This is a main reason why children with ASD struggle socially. However, there are ways that music can enhance a child with ASD's ability to multi-task, making it easier for them to interact with others. Hourigan and Hammel showed that simple activities which incorporate music and movement can help a child with ASD gain confidence socially. One of these activities consists of a child with ASD and a music therapist passing a ball back to each other while singing.[53] Exercises such as this one allow the child to complete two tasks at a time, without the pressure of having to have one on one communication with somebody.

Fannigan and Starr (2018) show specific social areas which are met for a child with ASD when they are involved in music. These areas are "(1) the nature and degree of relationship to an adult as a person; (2) communication; and (3) drive for mastery."[54] These authors show results of a completed study which examined each of these areas of sociability on five males with ASD from ages five to seven. In this study, four of the students showed an increase in sociability once they were introduced to music therapy. Each of these areas were strengthened as a result of the children occupying themselves with music.[55]

Another study found that musical interaction therapy (MIT) can improve social interactions amongst children with ASD. In this particular study, MIT was used through the

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[53] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 25.

[54] Finnigan, Emily, and Elizabeth Starr, "Increasing Social Responsiveness in a Child with Autism," 14, No. 4, (2010): 323, accessed June 30, 2018, http://journals.sagepub.com.ezproxy.liberty.edu/doi/pdf/10.1177/1362361309357747.

[55] Ibid.

process of music being played during an interaction between a mother and child. The child in this study was a three year old who had severe delays in communication. The following actions were tested during this study: "a) amount of time elapsed without social acknowledgement; b) frequency of eye contact; c) child initiated interactive involvement; d) child's positive changes to interaction; and e) symbolic play."[56] During the year and a half that this study took place, the child's ability to address and respond to her mother, establish and maintain eye contact and start interactions with her mother all increased. In addition to the increases in interaction, the results also showed decreases in how long it took the child to respond to her mother. The observers of this study concluded that the child undoubtedly showed progress over the duration of this time period. The authors of this study pointed out that the progress could partly be due to how the mother responded to her child. Nonetheless, because the child started reacting positively to her mother while the music played, it appeared that music increased the child's social abilities.[57]

Cognitive Conditioning

In addition to children with ASD benefiting physically and socially through music therapy, it also has been found to assist them mentally and emotionally. Kim, Wigram and Gold (2018) studied whether music has positive effects on the part of a child with ASD's brain which deals with emotions. These authors point out that "music acts as an essentially emotional, relational and motivational medium."[58] Through the avenue of music, children with ASD can

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[56] Finnigan, Emily, and Elizabeth Starr, "Increasing Social Responsiveness in a Child with Autism," 325.

[57] Ibid.

[58] Kim, Jinah, Tony Wigram and Christian Gold, "Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy," *SAGE,* 13, No. 4, (2009): 390, accessed June 2, 2018, http://journals.sagepub.com.ezproxy.liberty.edu/doi/pdf/10.1177/1362361309105660.

strengthen their brains to where they can experience emotions, just as others around them do.[59] When children with ASD are able to express themselves emotionally/mentally, they will then be able to process information and learn in a clearer and more concrete way.

A study was conducted by Barry Kolman which tested a child with ASD's cognitive skills through private music lessons. Kolman began experimenting with his thirteen year old daughter who was diagnosed with ASD. This study consisted of Kolman giving his daughter private clarinet lessons for three months, documenting her emotional behavior throughout the process. Kolman decided to perform this study on his daughter to see if it could help her overcome emotional stress which she struggled with on a daily basis. Mano, Kolman's daughter would frequently have "emotional breakdowns" which caused her to become discouraged. In his paper on the observations made during this study, Kolman explained that Mano did not understand why she was having a breakdown; additionally, she could not control it. Kolman also wrote that Mano felt "alone" at school, as well as at home. These observations of his daughter led him to start private lessons and write down the outcome to show the correlation between Mano's syndrome and music.[60]

In his article "Easing Autism with Music," Kolman found that Mano continually improved emotionally through the private lessons. After taking clarinet lessons with her father, Mano was able to control her emotions more and react to situations without becoming angry or frustrated. Post lessons, Kolman said the following about Mano; "She is aware of her feelings

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[59] Kim, Jinah, Tony Wigram and Christian Gold, "Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy," 390.

[60] Kolman, Barry, "Easing Autism with Music," *The Education Digest,* 78, No. 8, (April 2013): 66-68, accessed June 2, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/1324617975?pq-origsite=summon&accountid=12085.

and can stop herself from going there. Playing music evened out her behavior and calmed her down a lot."[61]

In addition to Mano successfully managing her emotions due to musical interaction, her memory and cognitive skills were also strengthened. Kolman explained that Mano would often forget simple things about her day, as well as forget to bring things home. After the music lessons, Mano's forgetfulness extremely lessened according to Kolman's observations.[62] Another key improvement Kolman noticed in these lessons was how quickly and sufficiently Mano was able to learn the clarinet, which is a very intricate and difficult instrument to grasp. During one of Mano's performances, Kolman decided to play along with her, improvising a harmony part. Kolman was concerned that this would throw her off, since she did not practice with him harmonizing. However, he stated that she played the piece perfectly and left the audience amazed. Mano continues to excel in clarinet playing as well as her studies in school.[63]

Neha Khetrapal focused on whether pitch plays a significant role in the emotional state of a child with ASD. He stated that "music can be employed to alleviate emotion recognition deficits in individuals with ASD because tonal pitch differentiation is the primary means by which emotions are perceived."[64] Khetrapal observed people with ASD are especially proficient at hearing correct pitches. Therefore, due to the relationship between pitch and emotions, children with ASD enhance their emotional state by partaking in musical engagement.[65]

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[61] Kolman, Barry, "Easing Autism with Music," 66-68.
[62] Ibid.
[63] Ibid.
[64] Khetrapal, Neha,"Why does Music Therapy help in Autism?", *Empirical Musicology Review,* 4, No. 1, (2009): 13, accessed June 2, 2018, https://kb.osu.edu/dspace/bitstream/handle/1811/36602/EMR000065a_Khetrapal.pdf.
[65] Ibid.

Attention is an element which is often an incredible struggle in children with ASD. Because children with ASD have difficulties paying attention, it affects them in many different areas, such as the social aspect which has previously been mentioned. Kim, Wigram and Gold (2018) stated that "there is growing consensus that the disturbance in the development of joint attention skills is the major characteristic of the social deficits in young children with autism."[66] These authors found that music is a beneficial way that children with ASD can increase their attention spans, furthering their success in school and other important aspects of life.[67]

Carolyn J. Murrock and Abir K. Bekhet presented the idea that musical interaction enhances brain movement; which increases the cognitive ability of individuals. These authors found that once an individual is engaged in music, these strengths will last with the individual for years. It is hypothesized that when children with ASD interact with music, their brain is being built up, causing them to think and respond as others do. When a child with ASD is involved in music, it appears to open up the doors for their brains to continually be strengthened, allowing them to function cognitively through teenage years and beyond.[68]

Nick Zangwill, a professor of philosophy at Hull University, stated that children with ASD are capable of understanding other people on some level, but they struggle with expressing themselves emotionally, unlike children who do not have ASD. He clarified that children with ASD do possess emotions but that they cannot easily communicate those emotions with others whom they are around. Children with ASD also have difficulty "describing" the emotions which

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[66] Jinah, Kim, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," 1758.

[67] Ibid., 1764.

[68] Murrock, Carolyn J., and Abir K. Bekhet, "Concept Analysis: Music Therapy," *Research and Theory for Nurse Practice,* 30, No. 1 (2016): 49, accessed June 19, 2018, https://www.ncbi.nlm.nih.gov/pubmed/27024999.

they are feeling. Understanding and acting on emotions is a normal part of human interaction for children, except for those with ASD.[69]

The article "Understanding the Mind of a Student with Autism in Music Class" explained that children with ASD have weaknesses with executive function and cognitive processing. Hourigan and Hammel defined the executive function as "several functions of the brain and includes planning, working memory, impulse control, shifting set, and cognitive flexibility."[70] Executive function plays a major role in a music classroom. There are many actions which a child in music class will have to grasp in order to participate in group activities effectively. Hourigan and Hammel showed that the following are aspects of executive function which children with ASD need help with:

> Fingerings, posture, hand placement, breathing, bow technique, and other skills that require cognitive flexibility. In vocal music classrooms, executive function can affect tone quality, posture, breathing, standing when singing, text memorization, dynamics, blend, and balance. In a general music classroom, executive function includes posture, instrument positioning, singing in a head voice, part work, remembering folk dance steps, and blend and balance when singing.[71]

These authors found that executive functioning is a fundamental asset to learning and demonstrated the correlation between music and executive functioning. When a child with ASD engages in music therapy, they are strengthening the crucial part of their brain responsible for executive functioning.

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[69] Zangwell, Nick, "Music, autism, and emotion," *Frontiers in Psychology* (December 6, 2013): 2, accessed, June 2, 2018, https://doaj.org/article/e246c7d2a4344e34a0981ab05651a2b7.

[70] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 24.

[71] Ibid.

The next term which Hourigan and Hammel define is cognitive processing, which refers to the amount of time it takes a child to "process instructions and prepare responses."[72] Since children on the autistic spectrum have trouble processing questions, giving feedback and responding in a timely manner, cognitive processing can be a major obstacle for students with ASD. Executive functioning deals with specific jobs of the brain, while cognitive processing refers to the amount of time a child can complete these tasks.[73]

Music can assist children with ASD to meet their executive function and cognitive processing needs, if they are given the proper teaching. Hourigan and Hammel add a table in their article which is titled "A Task Analysis for Preparing to Play Flute." This is an example of how music teachers can give children with ASD set guidelines which show exactly when and what to do. When music making is simplified, it can benefit children with ASD more than just give them pleasure. Executive function and processing needs are two areas of the brain which need to be strengthened in a child with ASD and music is capable of helping them in these areas.[74]

Certified music therapist Ryan Judd shows how music therapy relaxes children with ASD, giving them the means to enjoy the learning process. In one particular music therapy session, Judd taught a child with ASD who entered the classroom very agitated, upset and disinterested. Judd explained that as the girl walked in the room, he played some soothing background music at a slow, calming tempo. Although there was not a complete change at first, the girl showed signs of calming down as she sat down and began listening to the music. Judd used very little vocal commands, as to not overwhelm the child, but rather started quietly singing

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[72] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 24.
[73] Ibid.
[74] Ibid.

and playing, which allowed the child to join when she was ready. The change from when the child entered the classroom compared to the end of the session was a complete contrast. Judd stated that through the calming tone of the background music, use of objects to reduce fidgeting and musical involvement, the child's emotional and mental needs improved drastically.[75]

In their book on music therapy, Rachel Darnley-Smith and Helen M Patey gave statistics which were gathered from four different studies conducted on children with various special needs. One of these studies involved a four year old girl with ASD and supports the notion that music assists the mental and emotional aspects of a child with ASD's brain. These authors explained that when the child entered the music therapy room, she would run, yell and act out of control. However, when the music therapist would begin to play and sing, the child's unruly behavior would lessen. Helen, the music therapist continued to sing to the child, while accompanying herself on the piano, until the child's screams completely went away. With the music therapist still playing the piano, Sharon frantically ran to the drum in the music room and began beating it fiercely. As Sharon beat the drum, Helen played an upbeat, lively accompaniment on the piano. After a few minutes of beating the drum, the child started playing wind chimes that were near her. The therapist again changed her accompaniment, this time playing a quiet, smooth sound as the chimes were being played by the child. After about the second time of moving back and forth between these two instruments, Sharon started to connect which sounds correlated with each instrument. The music therapist noted that Sharon's attitude, behavior and interest grew each time this pattern was repeated.[76]

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[75] Judd, Ryan, "Easy-To-UseCalming Strategies For Autism," *The Rhythm Tree,* (August 7, 2017), accessed June 21, 2018, https://www.therhythmtree.com/video-blog.

[76] Darnley-Smith, Rachel, and Helen M. Patey, *Music Therapy,* (SAGE Publications, March 25th, 2018): 73, June 20, 2018, https://ebookcentral-proquest-com.ezproxy.liberty.edu/lib/liberty/detail.action?docID=334477.

Another study concerned Tom, a six year old boy with ASD as well as Down syndrome. This study showed an increase in the emotional state of the child involved in the therapy. Tom had major mental and physical delays upon starting music therapy classes. Darnley-Smith and Patey observed immediate joy and satisfaction in Tom in the very first music therapy session. Concerning this first encounter with Tom, these authors stated the following:

> To watch Tom at 6-years old in his first session, was to see a child apparently having fun, laughing and vocalizing as he beat a stick on a large shiny cymbal. He was obviously motivated and excited as he went round and round in circles, caught up in the sounds he was making, with his face close to the vibrating of the instrument. The music was giving him a new experience of his habitual twirling activity without taking him away from his normal sensory world.[77]

This example shows that music therapy is successful in bringing about emotions in children with ASD which are normally nonexistent.

Core Methodologies and Models of Music Therapy

One approach to music therapy was formed by Paul Nordoff and Clive Robbins. In this form of music therapy, every individual is capable of making music, with guided assistance from a music therapist. This creative form of music therapy allows the students to build upon their "expressive skills and their ability to relate to others."[78] In this model of music therapy, creativity is key on the part of the therapist. While practicing this form of music therapy, therapists "create music to meet individual needs."[79] In an article summarizing the Nordoff-Robbins approach, Kenneth Aigen states that "the mechanisms of music therapy process are located in the forces,

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[77] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73.
[78] "Nordoff-Robbins Music Therapy," *Nordoff-Robbins Center for Music Therapy,* (2018), accessed July 25, 2018, https://steinhardt.nyu.edu/music/nordoff/therapy/nordoff.
[79] Ibid.

experiences, processes, and structures of music."[80] Aigen continues to show that the creative model of music therapy is simply a focus on music and the dynamic nature which it consists of.

Receptive and active therapy are two other methods practiced by music therapists. Sarah Rose Black defined receptive therapy as a type of therapy that uses listening as the central force in the learning process. In receptive therapy, the student first listens, followed by a response of some form. Black found that upon listening to the music the students are led to "respond silently, verbally or with another modality."[81] In contrast to receptive therapy, active music therapy targets the student involving themselves in movement and action. Active therapy consists of "singing, music composition and instrument playing."[82] While receptive therapy serves an important role in music therapy sessions, active therapy is crucial for cognitive growth.[83]

Music therapy also contains traces of other methods of teaching music; such as the Orff method. Teachers can incorporate these methods into their music therapy sessions to extend the music-making process for children with ASD. Because the Orff method centers on movement, it can be a great asset in teaching music to students with ASD. The focal point of the Orff method is music-making through movement and action; including the use of many different types of instruments (glockenspiel, xylophone, metallophones etc.).[84] In the article "Orff and Kodaly –

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[80] Aigen, Kenneth, "Music-Centered Dimensions of Nordoff-Robbins Music Therapy," *Music Therapy Perspectives*, 32, No. 1, (2013): 19, accessed July 25, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/1627871775/fulltextPDF/B52FFC98669F4FF9PQ/1?accountid=12085.

[81] Black, Sarah Rose "Inter-Active Listening: Re-envisioning Receptive Music Therapy," *Canadian Journal of Music Therapy,* 20, No. 2, (2014): 2, accessed July 25, 2018, file:///C:/Users/Mahr/Downloads/Inter-Active_Listening_Re-env.pdf.

[82] Prakash, Roshini "Passive and Active Music Therapy," *Duke Word Press,* (2018), accessed July 25, 2018, https://sites.duke.edu/voicestogether/series-the-potential-power-of-music-therapy-within-the-autism-community/passive-and-active-music-therapy/.

[83] Ibid.

[84] Frost, Ruth G., "Orff and Kodaly – New Teaching Methods," *Music Journal,* 20, No. 2,

New Teaching Methods," Ruth G. Frost explains the Orff method as being hands on, interactive and engaging for the student.[85] Ryan Judd, a certified music therapist demonstrated how to incorporate Orff techniques into music therapy sessions. Judd consistently uses instruments of various kinds to engage the children, allowing them to be a part of the music as well. Sometimes the children do not use the instruments, however, simply holding one causes them to be a part of the music making process. Judd points out that music therapy consists of constant activity in order for the child to remain interested in the lesson.[86]

Another method of teaching music which can be practiced by a music therapist is the Kodaly method. The Kodaly approach focuses on singing; often through the incorporation of hand signs which each signify a different note of the scale.[87] Author Luca Tiszai explained that because music therapists use singing to engage activity, the Kodaly method is a great compliment to music therapy. Tiszai stated that "the theory and practice of Zoltan Kodaly created a field where education and therapy can meet, complement and fertilize each other."[88]

GIM (Guided Imagery and Music) is a form of music therapy that leads students to create visuals and remember previous information learned. Guided Imagery and Music also promotes the students to express themselves and feel emotion as others do. In GIM, relaxing music is often played in the background, allowing the students to calm their minds and bodies in order to

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(February 1962): 67, accessed July 26, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/740708249/fulltextPDF/9DBD44B458A642B4PQ/1?accountid=12085.

[85] Ibid.

[86] Judd, Ryan, (Director/Producer). (2013). "How Does Music Therapy Benefit Children with Special Needs?" [YouTube Video]. Retrieved, December, 8, 2016, https://www.youtube.com/watch?v=37deiLMJsxs .

[87] Frost, Ruth G., "Orff and Kodaly – New Teaching Methods," 67.

[88] Tiszai, Luca, "Kodaly Approach in the Crossroad of Education and Therapy," *Voices,* 15, No. 2, (2015), accessed July 26, 2018, https://voices.no/index.php/voices/article/view/804/684.

receive the best results in music-making. In addition to calming music, the students are also introduced to an image which correlates with the music. This allows the students to have a visual as they listen and engage in the music being played.[89] Helen L. Bonny, creator of Guided Imagery and Music (commonly known as the Bonny method), describes the method as follows:

> Guided Imagery and Music is defined as the purposeful use of prepared classical music by a guide or facilitator to evoke sensory and emotional responses in the listener. These responses, in the form of imagery, symbols, feelings, past and present life review, sensations, unfolding metaphors and transformative experiences, become the heart of the session.[90]

Guided Imagery and Music has been observed to be a fruitful form of music centered around imagery.[91]

Ryan R. Judd, a certified music therapist, demonstrates various ways that music therapy can be taught in his video "How Does Music Therapy Benefit Children with Special Needs?" One key aspect of music therapy seen in this example is improvisation. During this video presentation, Judd is teaching a student with ASD who is nonverbal. One way he allows the child to express his needs/wants is through an app on his device which has the buttons "yes" and "no." Through this video, Judd encourages the student to engage in music making with him, while asking him yes or no questions. The majority of this lesson relies on Judd using quick thinking and changing his teaching methods according to the way the child reacts.[92]

In the book *Listening, Playing, Creating: Essays on the Power of Sound,"* Carolyn Kenny presents the relevance of sound and how crucial it is for a children with ASD to be aware

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[89] Grocke, Denise, "What is GIM?," *Music and Imagery Association of Australia,* (2018), accessed July 26, 2018, https://voices.no/index.php/voices/article/view/804/684.
[90] Bonny, Helen L., "Music Psychotherapy: Guided Imagery and Music," *Voices,* 3, No. 10, (2010), accessed, July 26, 2018, https://voices.no/index.php/voices/article/view/568/437.
[91] Ibid.
[92] Ibid.

of the sounds they make. Kenny presented that all individuals have their own sound, even if they are unaware of this truth. In showing the importance of sound, Kenny stated that "it is the human spirit that sets human beings apart from the rest of creation. Human beings can organize the sounds that exist within the earth and create music out of them."[93] Because each human being has an individual sound, it is crucial that music therapists seek to find and nurture that sound within their students.[94]

In addition to sound, the concept of listening needs to be understood by music therapists in order for music therapy to work properly. Carolyn Kenny shows that people can listen in two ways; externally and internally. When individuals listens externally, they are processing the sounds which they hear and allow them to change their inner being. Kenny explained that "External listening can be seen as a movement of music directed from the outside to the inside." In contrast, internal listening involves only sounds within individuals, the sounds they make and process without any outside influence.[95]

It is important in music therapy that both external and internal listening are taught and applied in order to bring about positive results in children with ASD. Kenny stated "When the client and the therapist allow for both external and internal listening to take place, a new inner state of being is created in each one, a state of being which is still but moving at the same time, relaxed yet stimulated, passive but active."[96] When a music therapist encourages both types of

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[93] Kenny, Carolyn, *Listening, Playing, Creating: Essays on the power of sound,* (1995, New York University Press): 53, Accessed June 21, 2018, http://web.a.ebscohost.com.ezproxy.liberty.edu/ehost/detail?sid=7a70ab94-c6df-415a-99fc-d12ff763962f@sessionmgr4007&vid=0&format=EB&rid=1#AN=6205&db=nlebk.

[94] Ibid.

[95] Ibid.

[96] Ibid.

listening, children with ASD can learn to process what is going on around them musically, as well as understand that they are also capable of making and creating sounds.

Chapter 3 – Methodology

Introduction

The research used in this study examined how music therapy relates to children with ASD. This research sought to provide clear information on the subject of music therapy, autism and the correlation between the two. Through this research, readers can learn from both practitioners and scholars whether music therapy is an effective arena to apply to the world of children with ASD. The sources establish that music can benefit children with ASD on many different levels such as meeting their physical, social and mental/emotional needs.

Overview of Approach

One way to approach this study would be exploring firsthand the relation to children with ASD and music. However, a different method was used for this study. The researcher found that enough information was available to form a plausible argument via literature and case study survey without experimenting with human subject surveys, tests, examinations etc. It is hoped that by surveying many compelling claims from credible people in the field, the study will be useful within the academic realm of the music therapy discipline.

Design of Study

The method of this research is threefold, consisting mainly of qualitative research in the form of historical and descriptive research. A large portion of this research consists of information from past studies conducted by other researchers. This research sought to examine the purpose, method and limitations of each of these studies. Historical research is a significant component of this study because it helps to verify the foundational elements of music therapy as an academic discipline. Descriptive research addresses the recent studies and cases relevant to leading practitioners in the music therapy field; surveying current music therapy techniques in

relation to ASD - oriented environments is a necessary component to attend to questions two and three of this study.

This study relies heavily upon previous conducted research, including case studies, observations, examinations and written works about the topic. The study will show the process and results of multiple case studies on children with ASD and their responses to music. Studies such as the one conducted by Dieringer et al., focus on one particular effect of music on a child with ASD. This study focuses on how physical conditioning can produce positive results in children with ASD.[97] Another study that covers a specific result of children with ASD engaging in music-making is the study by Kern and Aldridge. In this study, the researchers observed how music can enhance social interaction amongst children with ASD.[98] Other sources present a more broad discussion of music therapy, showing multiple effects it can have on a child with ASD. One of these sources includes the book *Music Therapy,* written by Rachel Darnley-Smith and Helen M. Patey. This book contains a series of studies which displayed different outcomes of music therapy on children with ASD.[99] In addition to past studies, information was also gained through resources on the general topics within this study such as "Understanding the Mind of a Student with Autism in Music Class" by Hourigan and Hammel.[100] This source gives general information about children with ASD and how teachers can help them learn in a classroom

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[97] Dieringer, Shannon Titus, et al., "Increasing Physical Activity in Children with Autism Through Music Prompting, And Modeling," 421.

[98] Kern, Petra, and David Aldridge, "Use of Songs to Promote Independence in Morning Greeting Routines For Young Children With Autism," *Journal of Autism and Developmental Disorders,* 37, No. 7 (August 2007): 1264-1270, accessed August 17, 2018, https://link-springer-com.ezproxy.liberty.edu/content/pdf/10.1007%2Fs10803-006-0272-1.pdf.

[99] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73-81.

[100] Hourigan, Ryan M., and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 19-25.

setting. In the article "Autism," Volkmar and Pauls presented a detailed discussion of autism.[101] Similarly, the article "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)," show important facts about music therapy including its purpose and methods.[102] These sources, in addition to many more, are valuable to the study because they explain the information which is observed through the studies, experiments and observations.

This study began by gathering general facts about the intersection of autism and music-making. This allowed the researcher to gain an extensive amount of background knowledge about the subject before conducting the study. During this step, the researcher made use of scholarly historical resources. The next step in this process was to find credible sources which show data collected from other investigators. After these steps were completed, the researcher was then able to explain the relationship between autism and music therapy.

Research Questions

In order to study whether music therapy can assist children with ASD, this study consisted of the following research questions: "Why is music therapy important specifically relating to children with ASD?", "Do children with ASD respond to music making in a positive way?" and "In what ways does music making benefit children with ASD?"

[101] Volkmar, Fred R., and David Pauls, "Autism," 1133-1135.
[102] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)."

Chapter Four: Research Findings

Introduction

This study made use of findings from multiple case studies and experiments which have previously been conducted by scholars of music and psychology. Many of these studies were qualitative in nature. In chapter two, these studies were examined, noting the overall outcomes and results. The following information describes these studies in depth; answering the questions who, what, where, when, why and how of each study.

Response of Children with Autism to Music

In the article "Music, Autism and Emotion," Nick Zangwill referenced a study completed by Rory Allen and his associates. The purpose of this study was to answer the question "Do individuals with autism respond the same to music as others?"[103] The participants of this study included a group of individuals with ASD and a group of individuals without ASD. The first step of this study consisted of allowing the participants with ASD to listen to a common piece of music. Following this first step, the group of listeners who did not have ASD listened to the same piece of music. The examiners of this study watched each group, carefully noting the way each responded to the music.

The above study resulted in each group responding to the music in similar ways. However, the way each group perceived the music was not the same. While the individuals with ASD reacted similarly to the music they heard, their understanding of the music contrasted from the group of listeners without ASD. Through this study, the researchers found that individuals (adults or children) with ASD respond in a similar fashion to those without ASD but will most likely comprehend the music differently.[104]

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[103] Zangwell, Nick, "Music, autism, and emotion," 2.
[104] Ibid.

Motor Skills and Physical Conditioning

Concerning the topic of physical conditioning through music for children with ASD, a study completed by Shannon Titus Dieringer et al. represented the positive outcomes music has on children with ASD. Dieringer and her colleagues conducted a case study where they observed children with ASD who were integrated into classrooms with other children. This study was conducted during school hours in general education classes. The expected outcomes of this study was to demonstrate that "using music with lyrics that incorporate instructions for engaging in specific activities (e.g., running, kicking, throwing, and jumping jacks) has resulted in increased on-task behavior and physical activity."[105] The sequence of events observed by Dieringer et al. began by the teacher giving instructions to sing a song simply by showing the children the words and tune of the piece. Secondly, instead of giving verbal instructions alone, the teacher added movements and motions into her modeling. During this study the examiners took note of how the children with ASD responded during and after each type of instruction given by the teacher.

A couple of conclusions were gathered from Dieringer et al. through this study. First, the study found that music can be successfully used in general education classes to improve the health of children living with ASD. Secondly, after engaging in music-making with the second teacher, the children with ASD showed significant growth in classroom behavior and were able to remain focused longer. Through this study, Dieringer et al. observed that when movement is combined with music, children respond; not only by engaging in music but by showing increases in attention and focus after the music-making process.[106]

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[105] Dieringer, Shannon Titus, et al., "Increasing Physical Activity in Children with Autism Through Music Prompting, And Modeling," 422.

[106] Ibid.

In the article *Rhythm, movement, and autism: using rhythmic rehabilitation research as a model for autism,* Michelle W. Hardy and A. Blythe LaGasse discussed the significance of rhythm as relating to the motor cortex of the brain. These authors explored whether rhythm can improve motor function for individuals with ASD. Through previous research, Hardy and LaGasse found that rhythm is the most important aspect of music. Rhythm is crucial in music-making because it "serves as a timekeeper in the therapeutic application of music for motor rehabilitation goals and is foundational to auditory-motor synchronization."[107] The reason rhythm enhances motor function is due to the process of the cerebellum indicating when an action is going to take place. Hardy and LaGasse explained this process as follows: "the cerebellum predicts the timing of an upcoming movement, utilizes sensory feedback from the current movement, compares ongoing performance to an internal model, and then adapts responses such as force and/or trajectory."[108] These authors found that the relationship between the cerebellum and rhythm allow children with ASD to improve their motor ability without over thinking the process. When a child with ASD is engaged in music, rhythm automatically causes a reaction in the brain; producing movements which otherwise could not occur.[109]

Social Interaction

Simpson and Keen showed the results of a case study fulfilled by June Katigori, who holds a masters degree in music therapy. During this study, Katigori met with each child with ASD individually, rather than in groups. The purpose of this study was to grasp how children with ASD interpreted emotions of others around them. In this study, the examiner gave verbal instructions, visual instructions and verbal instructions with music playing in the distance. The

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[107] Hardy, Michelle W., and A. Blythe LaGasse, "Rhythm, Movement, and autism: using Rhythmic rehabilitation research as a model for autism," 2.
[108] Ibid., 4.
[109] Ibid.

results of this study were that children with ASD successfully responded to four different emotions (happiness, sadness, anger and fear) after being engaged in music. Simpson and Keen stated that a limitation of this study is that the researcher did not continue observing the students for a long period of time after these studies were conducted. However, during the sessions, the children could recognize the various emotions and give a response based off of the instructor's emotions.[110]

Another study concerning the social effects of music on children with ASD was completed by Doctors Petra Kern and David Aldridge. The purpose of this study was to "improve peer interactions and meaningful play on the playground."[111] To successfully show whether music intervention can improve social stability amongst children with ASD, an outdoor music center was added to the existing playground where the study took place. The music center, referred by the researchers as the "music hut," was located in one of the sandboxes and consisted of a wide variety of instruments. In addition to the music hut, the playground had normal outdoor activities such as swings, playhouses, climbing walls, slides etc.[112]

The main participants of the above study included four boys with ASD ranging from three to five. Others who were involved in the study were the classroom teachers (three), teaching assistants (three) and other classmates (twelve-fourteen). Three out of six of the teachers/assistants in the group had a background in music therapy. The other teachers each had years of experience in teaching and many held a bachelor or master's degree in education.[113]

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[110] Simpson, Kate, and Deb Keen, "Music Interventions for Children with Autism: Narrative Review of the Literature," 1510.
[111] Kern, Petra, and David Aldridge, "Using Embedded Music Therapy Interventions to Support Outdoor Play of Young Children with Autisim in an inclusive Community-Based Child Care Program," 270.
[112] Ibid., 276.
[113] Ibid., 277.

The sequence of events in the study were organized so that the participants could gradually become engaged with their peers. First, the children were allowed to play on the playground without any instructions or commands from the teachers. In this stage the teachers' only job was to ensure safety, being aware of where each child was on the playground. The next step in the study was for the teachers to individually walk each child to the music hut. During this stage, the child was led to engage himself with the instruments/activities in the hut without any additional commands/instructions. After step two, the teacher then led the child in musical engagement along with another classmate. In this step, the teacher led the children in song, modeled how to play each instrument and encouraged the children to play and sing together. The final stage consisted of the teacher stepping away and observing how the two children made use of the music activities together.[114]

In the eleven sessions of this case study, each child showed a certain amount of improvement with how they reacted to those around them; including teachers and peers. Eric would often show aggression towards his peers or seclude himself from them.[115] In the beginning of this study, his baseline reaction of peer interaction was 0%-18% but increased to 45% at the end of the study.[116] Before the study took place, Ben would almost never engage in conversation or play with the other children, but instead would run around the playground uncontrollably.[117] His baseline reaction was 0%-13% and showed slow progression throughout the study. However, by the end of the study, his peer reaction rose to 80%.[118] Philip would try to interact with his

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[114] Kern, Petra, and David Aldridge, "Using Embedded Music Therapy Interventions to Support Outdoor Play of Young Children with Autisim in an inclusive Community-Based Child Care Program," 279.
[115] Ibid., 276.
[116] Ibid., 283.
[117] Ibid., 276.
[118] Ibid., 283.

peers but did not fully understand how; often resulting in physical behavior towards them.[119] His baseline reaction was 15% and showed a significant increase during the teacher reaction stage of this study. In nine out of twenty-two of the sessions, Philip's peer reactions were over 80%. The fourth child in the study, Lucas, grew from a 5% peer reaction rate to 20% by the end of the study.[120] Before the study, Lucas would only interact with a child if he wanted to use his/her toy or object.[121]

Kern and Aldridge concluded a couple of key results from this study. The first observation made was that children with ASD very frequently involve themselves with their peers during outdoor play. Secondly, the music-making process resulted in social reaction of some kind with each child. However, the authors make mention that the "combination of environmental adaptations and individualized interventions" were the primary reason for improvement among the children with ASD.[122] One limitation of this study as noted by the researchers is the small amount of children that were observed.[123]

Another study performed by Kern and Aldridge focused on the use of singing as a way of communication between teacher and students who have ASD. The participants of this study were two, three year-old boys along with their classmates, teachers and caregivers. Philip and Ben both had speaking delays and had trouble interacting with the other children in the classroom. One area of difficulty for both of these children were transitions; including the process of starting class. Each child would show resistance upon entering the classroom which often resulted in

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[119] Kern, Petra, and David Aldridge, "Using Embedded Music Therapy Interventions to Support Outdoor Play of Young Children with Autism in an inclusive Community-Based Child Care Program," 276.
[120] Ibid., 283.
[121] Ibid. 276.
[122] Ibid., 288.
[123] Ibid., 290.

crying, screaming and unruly behavior. Thus, the purpose of this study was to experiment with singing; observing if it could assist children with ASD during their morning arrival and transitions. This study took place in a location created by the National Association for the Education of Young Children. The study was completed in the mornings during the arrival of the students and dismissal of parents.[124]

The procedure of this study focused around the four following steps of morning arrival: 1) Entering the classroom; 2) Greetings to a teacher/peer; 3) Greeting to a subsequent teacher/peer; 4) Farewell to parent/guardian; and 5) Engagement with a toy/activity in the classroom. To assist the children in this study who had speech delays, a hello sign was made which included the greeting and a picture of somebody waving. As soon as the child entered the room, they were shown the sign and heard a specific song sung to them. The songs were specifically composed for each child, based off of observation as to what the child individually responded to best. Each song clearly stated the five steps mentioned above.[125]

This study resulted in both children entering the classroom and engaging their teacher/peers with little or no resistance. Four days into this routine, Philip showed significant improvement in his ability to greet those in the classroom. At first, he could only perform two tasks independently; entering and playing with a toy. However, after nine days, Philip was able to complete each task independently, including greeting the teacher and classmates.[126] Ben's improvement was evident by the fourth session when he could complete three out of the five

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[124] Kern, Petra, and David Aldridge, "Use of Songs to Promote Independence in Morning Greeting Routines For Young Children With Autism," *Journal of Autism and Developmental Disorders,* 37, No. 7 (August 2007): 1264, accessed August 17, 2018, https://link-springer-com.ezproxy.liberty.edu/content/pdf/10.1007%2Fs10803-006-0272-1.pdf.

[125] Ibid., 1266.

[126] Ibid., 1268.

tasks without teacher assistance. Even though Ben struggled to complete step four (giving a farewell to parent/caregiver), he consistently showed growth in the other areas.[127] A limitation of this study is that Ben's song needed to be changed due to his lack of understanding of the fourth step. Kern and Aldridge stated that it is "unclear whether the modified intervention would have been effective if Ben had not experienced the original intervention."[128] Also, the small number of children observed adds another limitation to this study. However, the purpose of this study was to examine whether these two children could be assisted during morning routines which beforehand caused them much anxiety and stress. This treatment was found to be beneficial for these two participants.[129]

Authors Grace Lai et al. conducted a study which exhibited the power of the Broca's area in implanting speech among children with ASD. These authors explain that the Broca's area is often underdeveloped in children with ASD, resulting in speaking delays/struggles.[130] This study consisted of thirty-six boys with ASD varying in ages from eight-thirteen. The study also used participants without ASD for comparison of reactions. In the process of this study, the examiners used "functional MRI, functional connectivity and diffusion tensor imaging (DTI) to evaluate

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[127] Kern, Petra, and David Aldridge, "Use of Songs to Promote Independence in Morning Greeting Routines For Young Children With Autism," 1269.

[128] Ibid., 1270.

[129] Ibid.

[130] Lai, Grace et al., "Neural systems for speech and song in autism," *A Journal of Neurology*, 135, (2012): 961, accessed, August 19, 2018, http://rx9vh3hy4r.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info%3Asid%2Fsummon.serialssolutions.com&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=article&rft.atitle=Neural+systems+for+speech+and+song+in+autism&rft.jtitle=Brain&rft.au=Lai%2C+Grace&rft.au=Pantazatos%2C+Spiro+P&rft.au=Schneider%2C+Harry&rft.au=Hirsch%2C+Joy&rft.date=2012&rft.issn=0006-8950&rft.eissn=1460-2156&rft.volume=135&rft.issue=3&rft.spage=961&rft.epage=975&rft_id=info:doi/10.1093%2Fbrain%2Fawr335&rft.externalDBID=n%2Fa&rft.externalDocID=364345403.

functional and structural systems sensitive to language and music in low-functioning autistic patients and typically developing age-matched controls." During the study, in addition to sound stimuli, a silent video was played throughout to observe whether the visuals caused more of a reaction than the audio.[131]

The results of this study illustrated that music can strengthen the use of the Broca's area in children with ASD, resulting in speech improvement. Lai et al. stated that "music therapy for language and communication may be achieved through improving interpersonal responsiveness, increasing joint-attention and engaging mirror neuron responses in the inferior frontal gyrus during verbal communication coupled with musical tasks."[132] These authors continue to point out that during this study, each child with ASD that was tested increased in language and communication skills. The average range of speaking skills during this test was twelve -twenty-six, a significantly higher average than most children with ASD usually have. Lai points out that the children with ASD scored almost identical to the children without ASD during this study. While this study showed the efficiency of speech in children with ASD, one limitation was the use of familiar songs during the audio stage of this process. Lai et al. stated that a future study should be completed using unfamiliar sounds; comparing the reactions of how children with ASD react to both types of songs.[133]

Cognitive Conditioning

Jinah Kim et al. conducted a study which sought to improve the joint attention span of a child with autism through music therapy sessions. This study was completed at Jinah Kim's private clinic in Seoul, Korea and involved thirteen boys and two girls ranging from ages three-

[131] Lai, Grace et al., "Neural systems for speech and song in autism," 962.
[132] Ibid., 973.
[133] Ibid.

five. The study was performed over the span of roughly six to eight months, consisting of twenty-four weekly sessions. Twelve of the sessions were music therapy sessions and the other twelve were playtime sessions. During the study, the children were divided into groups of two. Group one had their music therapy session first which was followed by the controlled playtime session. Group two engaged in playtime first, followed by the music therapy session. The music therapy and playtime sessions were both divided into fifteen minute increments. The first fifteen minutes were solely child led, whereas the last fifteen minutes were teacher led.[134] Both sessions made use of props to engage the child; including various instruments and toys.[135]

The results of this study show that "music therapy was significantly more effective than play sessions in addressing joint attention skills."[136] Jinah et al. included multiple graphs in their observations which exhibited the average growth of attentive behaviors from the participants. One chart showed that the process of gaining and maintaining eye contact grew more in the music therapy sessions over the playtime sessions. During the music therapy sessions, eye contact was sustained for over thirty seconds more than in the play time sessions.[137] Another attention skill that was observed in this study was the ability of turn-taking. While both groups showed progression during the second half (teacher led) of the thirty minutes, the increase was higher in the music therapy sessions. Jinah et al. observed that during the music therapy sessions, turn-taking was given in longer periods of time than during playtime. Another notable

[134] Kim, Jinah, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," 1759-1760.
[135] Ibid., 1761.
[136] Ibid., 1762.
[137] Ibid.

observation was that group one showed increasing attentive behavior during playtime after they were first engaged in music-making.[138]

The authors of the above study cited that one limitation was the amount of children who remained in the study throughout the entire time frame. Five students gradually dropped out of the study due to medical reasons and travel inconveniences. This left ten students to be examined during the six-eight months of the study. However, these authors stated that even with the drop outs, the study still consisted of significant results that showed music-making has the ability to increase attention among children with ASD.[139]

The study observed by Rachel Darnley-Smith and Helen M. Patey show the emotional benefits of music therapy for children with ASD. The participants of this study included Sharon, an extremely active four year old child with ASD. Like many children who have ASD, Sharon could not interact with others around her and showed disinterest in almost everything. The other participants included Sharon's mom and therapist. The setting of the study consisted of a music therapy room made up of colorful instruments and calming background music.[140]

Darnley-Smith and Patey noted the first order of events during this study was the therapist playing lively piano music while singing a "hello" song to Sharon as she walked in. After this first step, the therapist carefully followed the child's signals and responded according to her actions. The child would often switch from instrument to instrument without being told to do so. When Sharon would begin playing another instrument, the therapist would accompany her on the piano. If Sharon beat drums, the therapist would play loud, quick music; whereas, if

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[138] Kim, Jinah, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," 1763.
[139] Ibid., 1764.
[140] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73.

Sharon would play with the bells, the therapist would play quiet, high pitched sounds. After a couple of times of repeating this sequence, the child began to understand which instrument would cause each sound.[141]

After coming to the music therapy session, Sharon's mother related to the therapist that Sharon would never stay focused on one activity for more than a couple of minutes without losing interest and moving on to something else. The music therapy session was twenty minutes long and Sharon's attention was kept for the whole lesson. Her mother also stated that Sharon rarely showed emotions in anything she did. However, during this music therapy session, Sharon showed signs of excitement as she returned to each instrument, listening to the different moods each one presented. This study is a clear representation of how music meets emotional needs of children with ASD. Sharon showed improvement in many areas which could assist her in school, work and family matters. Smith and Patey explained that "the therapeutic goals which gradually emerged were not specifically musical, but related to Sharon's whole personality and the difficulties she was experiencing in all areas of life."[142] Through this musical therapy session, Sharon's brain was able to work in a way which allowed her to recognize different sounds and where those sounds were coming from. Even if she did not realize it, Sharon's emotional parts of her brain were being strengthened through this simple exercise.[143]

Another study was observed which involved the same therapist as in the above study. This study observed Tom, a six year old boy who had ASD and down syndrome. When Tom was five years old, he could not speak or relate to others in any way and would often show

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[141] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73.
[142] Ibid.
[143] Ibid.

uncontrollable bursts of activity.[144] Helen, the music therapist, followed the same procedure as she did in the music therapy lessons with Sharon during this study. Helen paid attention carefully to Tom, taking note of what instrument he was using and how he was playing with it. While Tom would not directly communicate with Helen, he would intently observe her, noticing when she started and stopped playing the piano.[145]

The results of the study involving Tom presented that he showed incredible growth in controlling his emotions during the music therapy sessions. The observation was made that Tom would enter a state of relaxation and calmness anytime he would be allowed to play the instruments, including times with and without Helen's accompaniment.[146] Darnley-Smith and Patey stated that six months into Tom beginning music therapy sessions, he was comfortable enough for Helen to sit near him and converse with him about what he was playing. A year into the sessions, Helen was able to engage in musical games with Tom. The main results of this study show that "through working initially with his habitual responses, Helen was able to lead him into play and enable Tom to discover an awareness of himself and a sense of autonomy."[147]

[144] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73.
[145] Ibid., 79.
[146] Ibid.
[147] Ibid. 81.

Chapter Five – Discussion

Research Questions

During this study, a series of research questions were raised. The first research question which this research explored was: "Why is music therapy important specifically relating to children with ASD?" The preliminary findings of this research suggest that music positively addresses needs which are crucial for learning and interpersonal environments for children with ASD. Music therapy offers benefits which can serve children with ASD throughout each stage of their lives.[148]

The second question addressed in this study was: "Do children with ASD respond to music making in a positive way?" This study found that children with ASD actively engage with the musical material, respond positively and thrive in technical expressive and communicative elements of music-making. Many children with ASD have a "heightened musical aptitude and sensitivity to musical elements."[149] This thesis has found that a large population of children with ASD have a special connection to music, allowing them to benefit from music therapy. Music causes responsiveness amongst many different individuals, including children with ASD.[150]

The last research question asked was: "In what ways does music-making benefit children with ASD?" Research suggests that music promotes physical conditioning, social interaction and cognitive conditioning in children with ASD. Janzen and Thaut stated that music has the ability to strengthen the "motor and attention functions" of children with ASD. Through music-making, children with ASD can overcome obstacles they face as a result of ASD.[151]

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[148] Shakarashvili, Marina, "Music Therapy," 244.
[149] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)."
[150] Ibid.
[151] Janzen, Thenille Braun and Michael H. Thaut, "Rethinking the role of music in the neurodevelopment of autism spectrum disorder," 1.

Recommendations for Future Research

In addition to the research questions proposed in this research, a number of subsequent questions should be addressed for future research. One question pertaining to this research is: "What facets of music therapy most specifically relate to the music-making process with children with ASD in a classroom setting?" While music therapy is often an individual therapy session between teacher and student, the benefits of these sessions can carry over into the integrated classroom. One of the central focuses of music therapy is improving social interaction, an extensive part of public education. Authors Cheryl Young-Pelton and Doug Doty state that "autism means a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before the age of three that adversely affects a child's educational performance."[152] If a child with ASD can learn social interaction in a comfortable one-on-one environment, it could build a stable foundation which allows them to learn with other peers.

A second question for future studies surrounding this topic is: "in what ways does effective, classroom-oriented music-making benefit children with ASD – physically, emotionally, and sociocognitively?" Music therapy teaches children music in a structured way which develops physical skills such as "movement" and "dance," communication skills through the avenue of singing, and cognitive thinking skills through improvisational music.[153] Physical movement, emotions and interaction are all vital aspects of music; thus, as a child with ASD engages in music, they set themselves up for success in these areas.

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[152] Young-Pelton, Cheryl A. and Doug Doty, "Improving Educational Programs for Students with Autism in Rural Schools: A Preliminary Program Description of the Montana Autism Education Project," *Rural Special Education Quarterly,* Vol. 32, Iss. 3, (Fall 2013): 24, accessed July 24, 2018, https://search-proquest-com.ezproxy.liberty.edu/docview/1443780925?pq-origsite=summon&accountid=12085.

[153] "Fact Sheet: Music Therapy and Autism Spectrum Disorder (ASD)."

Another question to be answered in future studies concerning music and autism is: "what pedagogic methods derived from aspects of music therapy can be particularly effective in creating music-making experiences with children with ASD?" One key aspect of music instruction is to understand the physical, cognitive and social delays children with ASD often face. Authors Ryan M. Hourigan and Alice M. Hammel point out that realizing that students with ASD learn at a different pace than others is a pivotal point in teaching music to this group of students. In understanding this broad element of teaching, the music educator is then able to narrow down his/her teaching practices depending on the student's ability and needs.[154]

A discussion of why children with ASD may show a reaction towards music is necessary in understanding the content of this study. The question could be asked "is it the sound or music-making process affecting the child with ASD, or is it the relationship between the therapist and student?" While a caring, engaging therapist adds to the outcome of the music therapy process, the music appears to play a critical role. One of the previous mentioned studies exemplifies this truth by showing the observation of a child with ASD in her first music therapy session. In this study, the authors mention that in the child's first music therapy session, she was automatically attracted to the sounds she could make with the instruments before the therapist established any kind of relationship with her.[155] Likewise, another study showed a nearly non-verbal six year old boy engaging in music-making in his first music therapy session. In this study, the observers noted that Tom distanced himself from the therapist but would intently play his instruments and listen as the therapist played.[156] If the positive outcome of music therapy simply relied on the relationship between the therapist and the child, there most likely would be a larger lapse of time

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[154] Ryan M. Hourigan and Alice M. Hammel, "Understanding the Mind of a Student with Autism In Music Class," 24.
[155] Darnley-Smith, Rachel, and Helen M Patey, *Music Therapy,* 73.
[156] Ibid., 79-80.

before the child would engage in music-making. However, these two examples, along with many more, showed the children engaging in music making first, and then gradually becoming more comfortable with the therapists as time moved on.

Taking the struggles of a child with ASD into consideration – when they engage in music-making, the effects are clearly seen due to their condition before the music-making process. Whereas, even though children without ASD do benefit from music, it may not be as evident seeing that they do not deal with the same conflicts as children with ASD. Gordon Graham points out that every individual reacts and responds to music differently; causing a vast majority of emotions and outcomes. In light of this view, it can be concluded that the effects of music-making may contrast amongst children with and without ASD simply because each child is different.[157]

Before moving beyond this study, it is necessary to consider the following question: "how can general music educators apply the national music standards into their classrooms while addressing the needs of children with ASD through music?" Since 2014, the national music standards for music education are: "creating, performing and responding."[158] The NAFME (National Association for Music Education) website explains that each one of these standards is capable of setting students up for success in music education, future careers and other crucial aspects of life.[159] One way music educators can be proactive in following these standards in their classrooms is realizing the truth that every child is unique, therefore; learning differently than other children. Author Sheila Scott explains that having a "student-centered approach" is a central aspect of teaching children with ASD in general music classes. Scott continues by stating

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[157] Graham, Gordon, "Music and Autism," 39.
[158] "Standards," *National Association for Music Education,* 2018, accessed August 15, 2018, https://nafme.org/my-classroom/standards/.
[159] Ibid.

that while music educators should follow plans, curriculums, schedules, etc., flexibility and improvising is vital concerning children with ASD.[160]

Using instruments can enhance creativity and response in a child with ASD.[161] When a child with ASD engages with music through playing an instrument, it can lead them to recognize different sounds, which "allows opportunities for students to adjust to those sounds that may cause overstimulation."[162] Sheila Scott dictates that when a child with ASD uses instruments, they are responding to musical instruction, even if they may not realize it at the time. Since instruments are a practical and constructive avenue of learning in children with ASD, it is recommended for music educators to incorporate instruments into their lesson plans on a regular basis.[163]

Scott demonstrates how a teacher can effectively encourage performance for a child with ASD. Since singing is an extensive part of elementary music programs, it is necessary for a music educator to know how to properly teach a child with ASD to sing. Scott explains that children with ASD will oftentimes engage in a song by showing body movements without vocalizing any of the words. However, many times a child with ASD will gradually add vocalization into a song, after observing their peers. Scott states that "Early work in the classroom concentrates on helping these children explore their voices, keeping in mind that these children may be involved in group singing without the requirement to sing the words of songs

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[160] Scott, Sheila, *Music Education for Children with Autism Spectrum Disorder: A Resource for Teachers* (Scholarship Online, 2017), accessed August 25, 2018, *http://www.oxfordscholarship.com.ezproxy.liberty.edu/view/10.1093/acprof:oso/9780190606336.001.0001/acprof-9780190606336.*

[161] Ibid.

[162] Ibid.

[163] Ibid.

with correct tones, rhythms, and expression."[164] Music educators should be aware of this gradual progression which may need to take place in order for their students with ASD to gain confidence in performing.

In the article "Keys to success with autistic children: structure, predictability, and consistency are essential for students on the autism spectrum," author Scott H. Iseminger shows specific ways a music educator can adequately teach music to children with ASD. When teaching children with ASD music, educators should be mindful that there are two types of structure; physical and routine. Iseminger points out that one way in which teachers can establish physical structure in the classroom is by assigning the child with ASD a seat at the beginning of the school year and keeping it consistent throughout the remainder of the year. A carpet square can act as a substitute if a child will not sit in a chair. Iseminger shows that by reinforcing physical structure early on, teachers demonstrate their authority while allowing the child to formulate his/her own routine.[165]

Routine structure defines as the structure of what and when an activity takes place. Scott H. Iseminger explains that teachers should be mindful of what type of activity they begin and end with since children with ASD respond well to routines. An example of this type of structure is starting with a fast activity with lively music. This will most likely arouse the children, causing them to engage more in the music. Similarly, ending class time with a peaceful, laid back song will allow the children to relax from the stimulation they received during class.[166] Children with

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[164] Scott, Sheila, *Music Education for Children with Autism Spectrum Disorder: A Resource For Teachers.*

[165] Iseminger, Scott H., "Keys to Success with autistic children: structure, predictability and consistency," *Teaching Music,* 16. No. 6, (April 2009): 28, accessed August 26, 2018, http://go.galegroup.com.ezproxy.liberty.edu/ps/i.do?p=GRGM&u=vic_liberty&id=GALE%7CA197417600&v=2.1&it=r&sid=summon.

[166] Ibid.

ASD will quickly become use to a routine; thus, it is important for a music educator to establish routines which they plan on keeping throughout a long period of time.[167]

Another area of future research which would enhance the value of this study is an in depth comparison of children with and without ASD relating to music. Since this study consisted of a concrete evaluation of the music-making benefits of children with ASD, a further study of how children without ASD benefit to music could be of interest to readers. Concerning this comparison, specific research of how children without ASD improve in the three areas of focus (physical, social and cognitive) would be a profitable study.

Validity of Literature

For the completion of this study, an extensive amount of literature was reviewed and applied to this project. The majority of research used in this project is relatively new research which has been conducted in the past five to ten years. At least three of the case studies which were used in this study were completed within the last year. Many of the researchers of these studies noted their intentions to continue their research concerning the subjects of music and ASD. Through researching this topic, it was evident to the researcher that the subject of music therapy in connection to children with ASD is an ongoing and current topic of interest.

One of the strengths of this study was the credibility of the research which was used. A large part of this research was written by college professors of music, medicine, psychology etc. Because this subject involved discussions of health (physical weaknesses/brain function etc.), it was needful to gain information from a variety of different professions. For example, the article "Rhythm, movement and autism: using rhythmic rehabilitation research as a model for autism,"

[167] Iseminger, Scott H., "Keys to Success with autistic children: structure, predictability and consistency," 29. `

was written by professors of Biomedical Research in Music at Colorado State University.[168] Another credible source, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study" was constructed by music and art therapists, J. Kim, Tony Wigram and Christian Gold.[169] Articles such as these improve the likelihood of research validity in this field due to the level of expertise of the authors. This research was built upon information from scholars who hold graduate degrees in music, psychology, medicine and more.

Limitations

While this study succeeded in presenting the vitality of music therapy as an essential aid for children with ASD, a couple of limitations are present. One limitation is the lack of primary research which the researcher could have conducted with IRB approval. If this research was present, interviews of parents who have allowed their children to benefit from music-making could be used to enhance the truth of the last research question. Another limitation is the comparison between children with and without ASD was not studied in depth. While some of the studies used for this research mention the results of children with and without ASD, the main subject of the content solely focuses on the children with ASD. One more limitation in this study is the lack of longitudinal studies. Many of the studies observed in this study were completed over a short period of time and did not consist of the researcher continuing his/her observations on the students with ASD over time.

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[168] Janzen, Thenille Braun and Michael H. Thaut, "Rethinking the role of music in the neurodevelopment of autism spectrum disorder," 2.

[169] Kim, Jinah, Tony Wigram and Christan Gold, "The Effects of Improvisational Music Therapy on Joint Attention Behaviors in Autistic Children: A Randomized Controlled Study," 1758.

Application for Christian Educators

Christian music educators can use the information gleaned from this study to faithfully serve the Lord through the avenue of music. In John 13:34-35, the Bible states that Christians are to show the love of Christ to all. This passage reads: "A new commandment I give to you, that you love one another, even as I have loved you, that you also love one another. By this all men will know that you are my disciples, if you have love for one another."[170] Christian educators can apply this passage of scripture to their lives by patiently and effectively teaching children with ASD music. This passage proclaims that Christians are to love as Christ loved; thus, loving and serving even if it becomes difficult. Through this research, Christian music educators can learn more about how children with ASD respond to music; and more specifically, how music can bring them abundant benefits which will serve them throughout life.

Summary of the Study

This study examined the therapeutic approach of music concerning children with ASD; showing specific ways music-making can cause profitable results in their lives. The research provided used an approach of qualitative and descriptive research. Case studies and examinations showed how multiple children with ASD have benefited from music-making; including physical, social and cognitive areas of growth. This research sought to show readers the manifold advantages music has on a child with ASD, which could serve them in educational realms and beyond. It is the hope of this author that this research will encourage the reader to continue to research music therapy's effects on children with ASD.

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[170] "John 13:34-35," *Bible Gateway,* 2018, accessed August 26, 2018, https://www.biblegateway.com/passage/?search=John+13%3A34-35&version=NASB.

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