

Rhode Island College

The Power of Sound

The Positive Effects of Music for Students with Autism

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## Introduction

This undergraduate honors thesis will discuss the impact that music has on individuals with autism. Consideration will be given to diverse perspectives, including from individuals on the spectrum, as well as their teachers, parents, and siblings. These multiple perspectives will provide a wider outlook on autism than the narrow view that is sometimes represented in both popular culture and in scientific literature. By viewing this topic through the lens of education in a public-school setting, the study will demonstrate the importance of music in an autistic child's day. Certainly, music is an integral aspect of everyday life for many autistic students, ranging from therapy sessions to many other kinds of experiences. The researcher's goal is to examine these experiences in greater depth and to highlight the particular ways that music enhances the lives of people with autism.

Having a child diagnosed with Autism Spectrum Disorder may cause some parents anxiety. For other parents hearing this official news may offer a sense of relief. This relief may emerge because they now know why their child is developing differently than their neurotypical peers. No matter the reaction, from the moment of diagnosis and moving forward, the child's future may start to look different from what their parents had previously envisioned. The child's communication skills both receptive and expressive, social skills, self-regulation, sensory input, behavior, academics, and so much more become questions and worries for these parents or guardians. What is their next step to help their child succeed? According to Lygeraki, "autism spectrum presents problems in three areas, sociability, communication and imagination."

(Lygeraki 1). Diagnosis based on the *Diagnostic and Statistical Manual of Mental Disorders* fifth edition, also known as the *DSM-V*, requires that the individual has both persistent deficits in social, communication and social interaction and restricted, repetitive patterns of behavior. Even

though these specific categories must be met for an individual to be officially diagnosed, everyone who receives an autism diagnosis is completely different in their specific needs and abilities.

Over the last two decades, the number of people identified with autism spectrum disorder (ASD) has increased significantly. This prevalence appears to be staggeringly high. Recent data indicates that, “One in 54 children in the United States is estimated by the Centers for Disease Control and Prevention (2020) to have Autism Spectrum Disorder (ASD).” (Mercurio). This number has continued to increase over the decades since autism was first recognized. Statistics indicate that in some U.S. schools every other classroom has a child with autism in it. This increase in children with this diagnosis is in part due to diagnostic criteria changing and doctors becoming more familiar with the condition. Some people may wonder why else this number appears to continue to increase. This research study will not dive into the statistics and diagnosis side of things. However, there are many reliable resources available to the public that contain information such as “An Investigation of Increased Rates of Autism in U.S. Public Schools” by Cardinal. Cardinal concludes that the rise in diagnoses is due to the increased comfort in IEP teams’ ability to identify students, public awareness, variation in symptoms, and increased availability to resources (Cardinal 135-136).

Today often the immediate reaction from parents who suspect or get confirmation that their child has autism is to search the internet regarding the diagnosis. Parents may search for information, statistics, resources, therapeutic methods, case studies, and so much more. The volume and array of information available online from parents, therapists, teachers, medical experts, and individuals on the spectrum can overwhelm parents. There is not one easy path ahead and every path is different for everyone on the spectrum and the people around them. One

area of interest and continued research as a method of working with individuals who have gotten this diagnosis is through music therapies and interventions. Musical approaches continue to be an increasingly common method of therapy.

In some schools there are programs and teachers who use music as an intervention for students on the autism spectrum. There is research which shows many beneficial effects for students with autism spectrum when their education includes music. It is evident that, “Music itself may provide needed neurological stimulation, acting as a catalyst for change and growth” (Pries 106). The positive effects seen in these studies include increased communication skills, increased ability to regulate behaviors, smoother transitions between activities, increased academic successes, and more. Much of the existing research is directed toward the intervention of music therapy. However, the inclusion of music in a student’s day, in or out of the music classroom, has positive effects on their lives. A student of any age and any ability can benefit in many ways from music being a part of their lives and education. Individuals with autism can strengthen their communication skills, social skills, academic prowess, and their transitional behaviors. All these positive attributes and more show the true importance of having access to an education in music for all students and especially for individuals on the autism spectrum.

### Communication Skills

Communication is something that all human beings need in some capacity to live. For some individuals, communication can come easily, with the first words being spoken or understood at just a few months of age. While for other individuals developing communication skills can be a major difficulty. In fact, communication comes in many different forms and modalities. The first thing that may come to mind for many people regarding communication is orally produced words in a conversation. However, a huge part of communication is not just the

spoken words themselves. Such connections between people come in the form of both receptive and expressive verbal and body language. Communication includes specific facial expressions, the tilt of the head, a grab of a hand, spoken words, and more. Many of these aspects of life may seem natural to much of the population and come effortlessly without much thought. However, for people with autism these aspects of life do not come easily, and misunderstandings can be common. For example, when sarcasm or figures of speech are used in everyday language, interpreting nuances in words, tone, pitch, facial expressions, and body language may be challenging for many individuals on the spectrum.

Some individuals with autism are classified as being ‘nonverbal’ which implies that their means of communication is not through verbal words. They may be able to produce some words but typically it is not in a conversational format. Beyond verbal communication there are many other forms of communicating and ways to connect to ‘nonverbal’ or ‘non-speaking individuals’. For example, according to Benenzon, Wolf, et al, “Music can serve as a bridge between the nonverbal world of these children and what is to many of them the threatening domain of words” (Darrow 3). Music provides a way for people to connect and communicate with individuals who may have difficulties in these areas. There are many ways in which music teachers can create a fully inclusive classroom in which students do not need to speak to be able to actively participate and learn. Music can also be used as a tool to assist with improving areas of weakness including social skills.

### Social Skills

Social skills are integral for humans in order to live daily life and to conform to what is expected of them by society. In many ways social skills tie directly into communication skills. For example, as stated above, things such as sarcasm or figures of speech can be difficult for a

person with autism to understand. Individuals with autism often take things very literally and interpret ideas precisely how they are stated. In various social situations people who struggle with these things may be perceived as ‘weird’ or ‘odd’. This is especially the case with older students such as middle or high school age as social status often is seen as more important than it was when they were younger. Students may struggle to start conversations with others. A large part of a human being’s social time is spent communicating in some way. This communication may be verbal, through facial expression, body language, or through various other forms. All forms of communication are important and should be considered when working with students on the autism spectrum.

When this skill is more difficult for a person it adds an extra layer of anxiety when making new friends. Individuals with autism will often still crave this connection to people but they may need additional support systems to help them achieve it. They still want to fit in with their peers, like other children, but the odds are often stacked against them in these areas. It was noted long ago, when ASD was first labeled, that, “One way to help children with ASD improve social communication skills may be through music. Kanner’s (1943) earliest descriptions of ASD included observations of children with noticeable deficits in language and communication, alongside superior musical skills.” (Schmid). Even in very early literature on the topic of autism from 1943, well before much of the modern research was conducted, music is mentioned. Music is one of the first things seen as a way to help children on the autism spectrum with their social skills. Social skills can be very hard for these students in particular to develop, and music can play a part in helping them through their journeys.

## Case Study #1 The Power of Sound and Autism in a Young Woman's Life

Communication skills tie into many other areas of life such as social skills and overall comfort. One of the individuals interviewed in this study is a young woman with a diagnosis of autism. In this paper, she will be called Jessica, and her mother Kelsey, both pseudonyms to protect their identity. The pair had interesting insight to provide about Jessica's experience over her life thus far regarding her interest in music. According to her mother, prior to Jessica's access to music, "She was so quiet. If you knew how she was before versus the way she is now, and now she is a completely different person" and according to Kelsey "I think music did a lot of that for her" (Anonymous 2). As a young child, Jessica was reserved and did not have much personal communication and connection to the people and world around her.

Jessica's first access to music was made possible because of an iPod that was purchased by her mother, when Jessica was approximately nine years old. Kelsey had initially purchased the iPod for herself but soon saw positive effects in her daughter when she borrowed it. The effects of using the iPod were so beneficial and Jessica used it so often that Kelsey had to buy a second iPod and headphones so that Jessica could have her own. Before being able to access music on the iPod, Jessica had many anxieties. Stress and anxiety are commonly comorbid with autism and often diagnosed alongside autism (Hourigan 25). According to her mother, previously Jessica had needed to be carried everywhere to avoid meltdowns. She couldn't be in most social situations without being overwhelmed and as a result acted out. Once Jessica could access and control music by herself, being carried was no longer needed. Jessica was able to go into social situations with much more ease. Having music playing in her ears creates a sense of comfort, calmness, and security.



Within a few years, a girl, who at one point could not even enter a close friend's house without being carried on her mother's back, went on to being able to sing in front of a crowd of four hundred people. Today Jessica performs for many people and loves it, in fact, she has been given countless opportunities to sing at venues such as the Lincoln Center in New York City and at Fenway Park in Boston, MA. Jessica is also known around her hometown for bringing impromptu musical performances to people she knows. During the height of the pandemic when no one could see each other she would sing outside of her friends' homes. Music provides Jessica with a sense of comfort and confidence that creates calmness within herself which in turn opens doors for her.

The positive benefits that Jessica experienced because of her access and interest in music did not stop at just calming her anxieties. According to her mother, "[she] used to look up the lyrics of songs, and it increased her vocabulary, looking at the different way people wrote songs and what they wrote about." (Anonymous 2). Her interest in singing compelled her to look up the meaning of words and resulted in a large expansion of her vocabulary. This additional vocabulary that she gained from the songs she learns is transferable. Her ability to communicate grew as this vocabulary allowed her to have increased understanding in social conversations with peers, within classrooms. She learned why people would write songs and how they feel about things through their choice of lyrics. Jessica is learning how to interpret other people's language choices which in turn helps her understanding of the people around her. This ability to interpret language is a critical skill for a person on the Autism Spectrum to grasp and as a result help them with their social skills. There are infinite ways in which music can be written and used to express things. In this instance, Jessica is using a song's lyrics to make sense of what things mean and the world around her.

When Jessica was younger music also gave her something that she felt comfortable enough talking about with her neurotypical classmates. This was comfortable because it was a shared interest between everyone. She could talk about her favorite popular songs and sing them, and her friends were able to relate and talk to her about the songs as well. According to Kelsey, as a young child Jessica's peers had wanted to find ways to connect with her, but they did not know how. With limited communication skills at the time and high social anxieties, it made social connections to classmates difficult for Jessica. Once she had something that was common ground between them, all students had more ways to connect and share with each other. Other students would learn about her musical abilities and ask her to sing in the playground for them. This growing skill opened a social window for Jessica and her peers to connect and enjoy time with each other.

As Jessica grew and entered the local high school, she expanded her communication skills and confidence to join her high school's concert choir. This achievement was something that in the past may not have even been considered for her. While she has never taken any formal music lessons except her experience in the high school choir, Jessica has a strong, impressive singing voice. According to Jessica, she likes to sing alone and, in a choir, but prefers being in a choir. This is because of "all the people that I meet and get to spend time with" (Anonymous 1). Singing gives Jessica, the opportunity to connect and communicate with other people and as a result she has become a very social person. Music and singing have opened doors for Jessica that her mother Kelsey had previously not imagined possible. Jessica, now an adult, sings for [people around her local communities. She also works multiple jobs which requires her to communicate and socialize with both children and adults. It is reasonable to say that many of these life accomplishments may not have happened if Kelsey had not made the decision to purchase an

iPod for herself many years ago. Music has changed Jessica's behavior and improved her quality of life.

### Behavioral Challenges

Another common trait seen within individuals with autism, especially in schools, is challenges with behavior. Part of this comes from their challenges with communication. If someone is not able to communicate their needs, whether this was hunger, fear, anxiety, joy, etc. then problems may arise. Often, individuals on the spectrum also often have challenges with sensory issues. They may be sensory seeking, meaning that they are seeking stimulation through various forms such as sounds, textures, motion etc. On the other hand, an individual may avoid sensory input and try to block it out because it can be undesirable for them. Each individual is different with what sensory input they pursue and what is unpleasant to them. These sensory issues can also lead to behavioral challenges when their teacher doesn't understand them, or when the student cannot communicate what is wrong. Students may lash out verbally or physically to attempt to express what they are feeling. Their reaction may seem dramatic compared to whatever situation they are in, especially to someone unfamiliar with autism. However, to the individual experiencing the sensory issues it is truly a big deal and some individuals describe it as feeling painful. It is not the child's fault that they are acting out. Teachers, students, parents, etc. must all work together to help students through these behavioral challenges and to help them learn self-regulation and self-control.

### Case Study #2 The Power of Music and Autism in a Man's Life

The project's primary researcher has an older sibling who was diagnosed as on the autism spectrum at ten-years of age. Having the experience of growing up with him since birth is a large part of what has fostered the researcher's interest in this specific topic. The researcher's brother

will be identified as Fred in this documentation, which is an alias. Fred would be traditionally labeled as being ‘higher functioning’ or having lower daily support needs. In fact, before the classifications changed a few years ago in 2012, as a child Fred was initially diagnosed with Asperger’s Syndrome, which became part of the umbrella diagnosis of autism. While it is true that he has less intense support needs daily, he often requires additional support regarding mental and physical regulation. It is important to remember that every person on the autism spectrum has unique needs in terms of levels of support in varying areas of their lives. Different individuals will struggle with one thing more than others and then will excel in different areas more than others.

In this case music has played the function in Fred’s life as a method of regulation. It is a way to calm anxieties and express his emotions. Individuals with autism may struggle with emotions and understanding their intent (Hourigan 25). While it is in a more informal way, in contrast to therapies and education, it is evident that humming and singing are used by Fred as a regular coping mechanism in many situations. The researcher has viewed Fred singing or humming frequently, and it often occurs when he is stressed, annoyed, or even excited. It is used to express, manage, and understand his differing emotions. It has been mentioned to him many times before that he has a strong singing voice but typically, he reserves singing and humming to when he is alone.

Humming also can be considered a form of stimming. The vibration created in the nose and face when humming can provide sensory input and has a regulatory calming effect for some individuals. Stimming is a well-known term used within the autistic community. It is often seen as a repetitive behavior deployed as a form of calming or regulation. Stimming can take many a multitude of different forms depending on the individual and input they need during a particular

situation. Some examples commonly seen are rocking, vocalizing, repetitive physical motion, and many other things. At one time stimming was not seen in a positive light as it was seen as ‘weird’ or atypical. It stands out and those who wanted to mask or blend in to neurotypical people would try to diminish their stims. While there are still social stigmas in the modern-day, stimming is now seen in a more positive light and as a method of self-soothing. It is now seen as something that individuals with autism need to do to help make sense of the world around them. Fred’s stimming is a form of music that provides him regularity, reassurance, and repetition that helps him better understand his world and live in it more comfortably. More should be done to educate the world on what stimming is and how people to react or not react when they see someone stimming.

### Case Study #3 The Power of Music and Autism in the Lives of Twins

In a separate case study, in an interview, a father of twin seven-year-old children on the autism spectrum describes a similar method of soothing relating to music he has seen within his own young sons. The father states, regarding one of his twin sons that, “He [(Child 1)] especially loves to pause the songs and replay his favorite parts thereof, which are sometimes only a few seconds long” (Anonymous 4). Children with autism are often known to display various repetitive behaviors such as described here. These behaviors and actions may be related to the child’s need to regulate themselves and the world around them. When a song or section of a song is played repeatedly, then the child knows exactly what is going to be happening next. This is what the boy is doing through repeating his favorite parts many times. This repetition of music can provide a sense of comfort and stability and help to ease some of the child’s anxieties. Children may do this with a song, video, instrument, or other form of auditory stimulus.

Repetition is a method of self-soothing and is being used as a form of stimming from a source of external stimuli.

The boy's father also states that the other twin, "also likes to strike notes at the piano in a variety of registers, seemingly focusing on feeling the emitted vibrations" (Anonymous 4). The vibration from music can be seen as sensory stimulation, something that is often sought out by individuals on the autism spectrum. Each register of pitches will produce a different level and speed of vibration, which provides the child with whichever sensory need he is seeking. This vibration may not even be noticed by a neurotypical peer but an individual with autism can hone in on this sensation. This boy is using the different pitches and the vibration he receives back when pressing a key on the piano as a sense of stimulation and regulation. Regulation is a term used within the autism community to describe helping the individual calm themselves and make sense of the world. Music does not have to come from a formal educational setting for it to be positive learning opportunity. Simply having access to music, can make a difference in someone's life. The child is using the musical resource he has access to and learning ways to help himself. Lastly, the father states that, "At nighttime, quiet and gentle music very often calms them down before they go to bed" (Anonymous 4). In this instance music is being used as a calming mechanism. Music can be soothing and allow the boys to calm their bodies, relax and sleep. Sleep and insomnia can be something that individuals with autism can struggle with. Music is helping to combat this commonly seen difficulty and allowing the boys to hopefully get a better night's rest. Music's power can be a calming influence that provides peace and tranquility as well as an opportunity for communication and growth.

#### Case Study #4 and #5 The Power of Music and Autism from the Perspective of Music Teachers

During an interview with an experienced elementary school music teacher who works with students on the autism spectrum, she states that,

In my experience, music can be a steppingstone to sound formation and talking for some students. Two pitch (Sol Mi) singing can sometimes be imitated well before words are formed. Also, routines of stepwise repeated neutral syllable sounds have sparked some students to use their voice and/or body to show the sounds going up and down.

(Anonymous 3)

Music class provides an opportunity for students to develop new communication skills. Students on the autism spectrum often are known to struggle with all forms of communication, including vocal word formation. As stated here by this experienced teacher, she has noticed that the skills being taught in the music classroom can aid in beginning communication skills. The initial formation of sound and words on command is one of the first steppingstones to vocal speech. A student may be prompted to want to form these small words so that they can participate alongside their neurotypical peers and join in the fun. As mentioned by this teacher, in the interview, the students are also given the opportunity to express the musical idea or concept through means of bodily movement. This itself is a form of communication as students can show their understanding of the concept being taught. There are many different forms of communication and within a music classroom many of them can be explored and learned.

While these new skills can be huge steps forward for students it may not happen quickly and at times is not always possible. Communication can be made through other means, in this case through musical ability. As stated by the same teacher,

Interactions with peers in which talking to each other is not needed, such as [when] playing instruments can help boost the confidence of students with autism and encourage more interactions with peers. Students with autism sometimes excel in music and it gives neurotypical peers a chance to see them shine. (Anonymous 3)

This has been noted in many scholarly articles and by many in the field. For example, “Experimental studies have further demonstrated that musical perception abilities, such as identification and labeling of pitch (Heaton et al., 1998), auditory discrimination (Jones et al., 2009), and sensitivity for pitch direction (Heaton, 2005), are also preserved or heightened in individuals with ASD.” (Mercurio). Students with Autism have many of the same responses to music and in some instances can have heightened abilities in certain musical areas. Playing an instrument does not require a student to communicate verbally so students with autism may feel more confident to participate. Social interactions where students can gain confidence are great opportunities for these students to have success. When any student feels confident in what they are doing they are more comfortable and connected to their world. Music is an area in which students with autism often seem to excel. As a result, this increased success can provide students who may struggle in other areas the space to show what they are capable of in this musical area of interest.

Music classes and activities provide students with a safe space for their self-esteem and confidence to grow. An elementary music teacher stated that, “While their academic performance is observed and assessed, the greatest satisfaction is seeing how their confidence and self-esteem can grow over time. I have seen students come to music in the beginning of the year with lowered expectations placed upon them (by their classroom teacher).” (Anonymous 5). It is common for main classroom teachers to struggle seeing beyond a student’s disability and to



place lower expectations on a student. This can cause a student to have lower self-esteem and overall lack of confidence. The teacher continues and states that, “Some of these students are generally sad, have not particularly excelled in other areas, or have had a hard time fitting in. These students often surprise me by making more significant strides in music than their peers. As they continue to celebrate incremental successes, their own self esteem improves. This is the most rewarding part for me as a teacher” (Anonymous 5). This teacher has discovered that when giving students a space where they feel safe and have no limits their self-confidence and happiness increases. Once this has happened for a student the sky is truly the limit. Each success may be small, but everything should be celebrated, and students should be brought up and not down. The music classroom is an environment where this process of students being built up can begin and be fostered which will lead to significant personal and academic growth.

As mentioned above the music classroom is a perfect space for students with autism to excel and show off their skills. Students with autism can excel alongside every other student in the music classroom. When asked about ways that students with autism excel, one music teacher stated,

I have seen my autistic students excel in all of the same areas as my neurotypical students. Musically and socially, all students are capable of achieving in music. Students with autism have demonstrated a wide range of achievement, and I prefer to examine these achievements over time. The benefit of having the same students for multiple years is that I get to compare where they were to where they are now. There are no specific areas or trends I can point out (and I have looked for them). Each student is unique and will excel at what comes either naturally to them, or what interests them most. If anything, I will point out that for many of my autistic students with behavioral problems,

they usually behave a little bit better in music than in their classrooms, and there are always exceptions to this statement. (Anonymous 5)

This teacher has seen his students excel in his music classroom and has watched their progress over multiple years. Music classrooms can be a fun and safe space for students to be able to learn who they are and what they are truly capable of doing. This teacher has seen his students make achievements not just musically but also socially and communicatively. He has also been able to recognize that students' behaviors are also improved within music class in comparison to other classes and situations they are in. This improvement in behavior could be due to a student's personal comfort, enjoyment of the class, or many other factors at play. As he states there are always exceptions so it should never be assumed that every single student will have the same results. However, most students will make progress and excel in some aspects of a music class. Every student is different and has their own path forward which can be supported through an education that includes music. The importance of recognizing each student's uniqueness and that everyone is different was stressed by this teacher during his interview. He stated that "the same exact approach that works for one student can be detrimental to another" (Anonymous 5). All music teachers work to learn what is best for each of their individual students and to find ways to implement them. All students can benefit from this teaching mentality whether they are considered neurotypical or not.

Once the music classroom is established in the student's mind as a safe space where they feel confident to try things, then a world of new possibilities is opened. This safe space can be created in a variety of ways. Firstly, it is important for a routine to be established and for students to become familiar with that routine. This routine should stay consistent as transitions can be hard for students on the spectrum. Additionally, students can begin to feel safe, as mentioned

before, by giving students the opportunity to express things in nonverbal ways such as bodily movement, instrumental playing, etc. Something important to remember is that “Music is multisensory and therefore can reach children who are visual, auditory, and kinesthetic learners (Anonymous 3). Providing students with a variety of activities and lessons that explore all these different areas of learning can also help students open up in new ways and feel comfortable in their environment.

A student’s school environment is not exclusively in the music classroom. Students spend most of their day in different settings and something that can be greatly beneficial to music teachers working with individuals on the spectrum is having open communication with the student’s team of teachers. There are laws that state that all teachers must follow students’ IEP and 504 plans as outlined. An IEP or 504 plan will outline the students’ individual educational goals, therapies students must receive, and aspects of their day which the teachers must follow. A student’s team of teachers may include a general classroom teacher, special education teachers, PTs, OTs, language specialists, elective teachers, etc. One teacher said that “When issues arise, I bring them up with the team and we use interventions as needed” (Anonymous 5). This opportunity gives the music teacher assistance in dealing with situations where they need additional support.

Unfortunately, the entire team of teachers is not always readily available for music teachers to access. Another teacher said in an interview that, “Unfortunately, I do not meet with the IEP teams for each student. I do touch base with the classroom teachers and teacher assistants who are with the children for most of the day to see if there are certain triggers, I should be aware of (Anonymous 3). Any additional support or collaborative work that can be possible between a music teacher and other teachers in the student’s life can be beneficial for all involved. Some

music teachers have more access to this team and others have less. It is unfortunate when less collaboration is possible. Having open communication between all teachers and therapists who are working with an individual student is the best-case scenario. While knowing triggers for this teacher's students is very important more could be learned. Sharing knowledge about the individual child and the learning interventions that have worked elsewhere may enhance learning in the music classroom and techniques applied in the music classroom may improve the child's skillsets elsewhere.

### The Power of Music as an Intervention

In a study from Vaiouli, Grimmet, and Ruich the researchers looked at interventions being done with three kindergarten aged children, all diagnosed as being on the autism spectrum. During the duration of the study, "Each child received weekly, individualized MT [music therapy] sessions by a board-certified music therapist (the primary investigator) in the school's music room for approximately 30 min (the equivalent of an instructional school period)" (Vaiouli et al 78). Soon after the individual interventions started, it was clear that positive changes were starting to occur. The article includes that, "shortly after the beginning of the intervention, the educators in the resource room started noticing changes in the children's communicative actions and automatically contributed these changes in student actions to the music intervention" (Vaiouli 80). The educators, who see these students daily, quickly began to see changes in these children which they knew was from the music interventions. At the start of the study all the students had varying communication levels, all being lower than typical of children their age. After the study, the educators of these children continued to incorporate more music in their daily routine.

This same specialized study also expresses that these newly gained skills and growth for these students continuously began to be used outside of the classroom and into their daily lives. One of the three Kindergarten students who participated in the intervention was referred to as Bill in the study. Prior to the added music interventions Bill typically needed adult prompting whenever communicating. Once the interventions were taking place in his classroom, Bill's mother commented that, "[Bill] is now singing in the car ... he does well, and this time spent in [music therapy] MT makes him more comfortable with new things and communicating in a new way." (Vaiouli 80). Bill began to make progress in music therapy during the school days. From there, it became clear to his mother that this progress was now influencing other aspects of his life. He is now making progress towards becoming increasingly verbal as he has a new way to express himself. Once a student begins to progress in a music classroom or therapy that can then be reflected in many areas of their life other than just in that classroom. Bill can communicate in a new way and this form of communication may be able to help Bill express how he is feeling. Any form of unprompted communication can be seen as progress for Bill. This growth in communication skills via the use of music therapy is a major initial steppingstone in Bill's journey. Maybe one day he will be able to being able to freely communicate his feelings and desires in his daily life.

#### The Power of Music and its Benefits in Education and Beyond

In many different contexts music is not viewed as a core 'academic' course. Instead, music classes are often seen as an extra or a 'special' part of school. It is a break in the day for both the student and main classroom teacher. While in some specific ways this may be true, as time with music time can be a more fun experience for students to break up their day. The result of this viewpoint is often that music is unfortunately not given as much credit as deserved when it comes

to the overall impact it has on students. It is clear across many students in different ages and developmental stages that “Musical training has also been associated with positive changes in cognitive measures, which have been suggested as far-transfer effects of musical learning, such as reading and spelling” (Rose 75). The skills gained and cognitive increases that occur within the music classroom do not stay just within the confines of that single room. The educational, communicational, and social leaps made by children within music classrooms, especially those on the autism spectrum, reach far beyond that room and can aid in the learning of many other skills of the child’s daily life. Music class is a time for fun and progress to unite and create a positive experience for all involved.

Studies have revealed drastic improvements in a variety of student skill sets, outside of their communication skills. For example, as Jessica’s mother said, once she had access to music Jessica could spend more time in the classroom with her peers. She became a much calmer child with less severe anxieties. Now that she has this overall calmer demeanor Jessica was able to spend more time in a traditional academic classroom. As a result, there were clear improvements in her academic skills as more time was able to be spent on tasks in other content areas. This shift then widened the world for Jessica, helping her to learn new skills in areas like math, reading, science, and more. Related to this example Carnahan states, “In addition to visual learning materials, music may promote increased engagement, and improve student attitudes and abilities to process and recall information” (Carnahan 39). As stated, with music in education, a child can become more engaged, improving their ability to recall information. Music catches the attention of any student and provides them all with another pathway to learning and success. In some cases, music classes are a starting point from which many positive improvements can sprout.

## The Power of the Music Classroom

The music classroom is a place of learning, often not considered to be an academic subject. However, music can function academically just as any other subject can, in fact, “The music classroom can provide a positive environment in which students with autism can succeed academically while behaving appropriately” (Darrow 4). Overall, the music classroom is typically seen as fun, stress relieving, and a break for students and teachers. Music time is a time for students to learn and succeed with positive stimuli. Students are learning about music and progressing towards music related goals while learning life skills and socializing with other students. Music class is a very social time where students interact with one another and the teacher. Social time can be difficult for some students on the autism spectrum, but this is an opportune time to work on social and academic skills while in a fun and positive environment. A study by Darrow states that, “In fact, the music classroom is probably the only school environment where social and academic integration of these students can occur relatively easily and naturally” (Darrow 5). Students with autism can sometimes spend hours of the day outside of their ‘main’ classroom with the remainder of their neuro-typical classmates. Music class is a time where all students can come together and learn together as one class no matter the disabilities present in the classroom.

Music class is an opportunity to help children on the spectrum learn, socialize, communicate, and to make sense of their world. The best place to look for proof or evidence of things is straight from its source, from an individual on the spectrum. In a book entitled *Speaking for Ourselves: Conversations on Life, Music, and Autism* by Bakan interviews were conducted with individuals on the spectrum that provides interesting perspective and information. One individual named Gordon says that,

The only one that made any sense was music: music was the lens through which I had always viewed the world. [...] Music has the same ability to stimulate recall for me that smell has for everyone who can smell. I formed my identity around music-what I liked, what I listened to-far more than anything else." [...] "So when I oriented my life toward music as a vocation," Gordon reminisces, "I blossomed academically and socially for the first time ever. I was totally mediocre in public school, (but) in college, I graduated near the top of my class. I was hyper-focused and lived the study I was doing (Bakan 175)

Music provides this individual with ways of growing into who they are and who they want to become. A common complaint articulated by people with autism is that they struggle to make sense of the world. Music creates the stability and lens to help Gordon develop the understanding of the world he needed. While academics were not his strong suit in high school, he was able to pursue music in college and soar academically. He went on to say that he always received A's in music school except for a semester where he transferred schools. Transitions can be difficult for individuals with autism, so it makes sense as to why that semester he got slightly lower grades during those semesters. Overall, it is clear that when able to pursue his interests Gordon was able to excel in new ways. Gordon's brain made sense of the music and allowed him to improve and develop his talents more fully.

What does Music do for the Brain?

The main focus of this research study is not the scientific side of how a neurodivergent brain is affected by music. However, it is important to touch on this in some capacity to mention how these effects lead to the positive progress seen in individuals with autism as explored here. Something to consider regarding this, as stated in a neuroscience and behavioral review by Brancatisano Et al, is that,



The efficacy of music-based interventions can be investigated on four levels of analysis: therapeutic contexts, active ingredients, neural mechanisms, and benefits. Most research on music-based treatments has been restricted to confirming that interventions associated with particular therapeutic contexts confer tangible benefits, with some speculations on the underlying mechanisms involved, but limited attempts to identify the active ingredients or distinct qualities of music responsible for these outcomes. (Brancatisano 600)

There are a variety of ways to look at this topic of music and its connection to the brain as outlined above. While the more anatomical side of these interventions can be investigated the majority of completed research studies have provided confirmation of successes through therapeutic contexts. Some of these more therapeutic circumstances have been explored throughout this research.

While more limited there is still some interesting knowledge to be gained when looking at what music really does to the brain. For example, through significant research it has been found that, “Many different regions of the brain respond to the perceptual and emotional aspects of music, and the brain alters itself to react more strongly to musical sounds that become important to an individual” (Weinberger 90). Many different components of the brain are in action when listening to or creating music. Music can help activate parts of the brain which may be more dormant or typically have less activation. Music is engaging and has the ability, “to activate widespread brain regions, which include cortical regions spanning temporal, frontal, parietal, occipital and motor cortices, as well as deeper mid- and hind- brain subcortical regions (e.g., basal ganglia) and the cerebellum” (Brancatisano 603). By activating the brain in different ways humans can have access to their full range of abilities. This is especially helpful for

individuals with disabilities such as Autism. As stated above music can cause stronger reactions when something is important to the individual and in this case can in turn assist individuals with Autism express their emotions. This is a skill which can be a challenge for individuals on the Autism Spectrum.

## Conclusion

Music is a powerful force that moves our feet to a fun beat, helps people express their feelings, and moves lives forward in ways that had not seemed possible. Music can open a girl's world, freeing her from major anxieties and creating life-changing opportunities. Music can help individuals with autism find their words and make sense of the world around them. Providing music therapies and classes to students can help them and their parents. Parents may need something to grasp on to that is positive and helps them to make sense of their child's diagnosis. Music can be this thing for them to help. Nothing is meant to 'fix' these children as nothing is wrong with them. Students with autism learn differently and the important people in their lives work together to find what helps each individual achieve their full potential through any challenges they may face. These methods of assistance are going to look different for everyone. Music is always a viable option that can be explored to assist students on the spectrum. At any age but especially for young children, this is true. It is known that "Music is promising within early intervention for young children with ASD and their families" (Thompson & McFerran, 2015)" (Mercurio). Continuing and further exploring programs in schools is critical as it provides all students no matter their neurotype a place to have fun, learn, and discover themselves. Music programs being cut across the United States has caused detriments in ways that some will truly never know. Music is not a secondary need in schools. The power that music has as stated here is

only the tip of the iceberg of what could be possible with more specialized music therapies for students with all disabilities.

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Notes

<sup>1</sup>Anonymous 1, zoom interview, Apr 15, 2022.

<sup>2</sup>Anonymous 2, zoom interview, Apr 15, 2022.

<sup>3</sup>Anonymous 3, email, September 15, 2022.

<sup>4</sup>Anonymous 4, email, September 27, 2022.

<sup>5</sup>Anonymous 5, email, September 27, 2022.

<sup>6</sup>Child 1, email, September 27, 2022.

<sup>7</sup>Child 2, email, September 27, 2022.