

**Joint Music Making in a Montessori Classroom:
Is There a Correlation Between Joint Music Making and Prosocial Experiences?**

By
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Abstract

Extensive research has been shown to support the idea that joint music making experiences significantly increase a sense of social connectedness among its participants. Research has further shown that shared musical experiences which include alignment to a central beat promote prosocial behaviors. The purpose of this study was to investigate whether joint music making experiences added during the morning session of a small private Montessori three-to six-year-old classroom would increase the prosocial and emotional behaviors of a four-year-old student who had been struggling in these areas. During the study, fifteen to twenty minutes of joint music making sessions were added every morning for two weeks, followed by one week of no joint music making sessions. This cycle repeated itself three times, creating a nine-week study. During the study, the child was observed and tally marks were collected noting a variety of social and emotional behaviors. The child's behaviors and attitudes were also monitored and recorded on a rating sheet by his parent at the time of pick up and during the fifteen-minute ride home from school. A pre and post parental survey noted the effect of the sessions on the child's behavior and attitude in the home. The cumulative results of the study showed that there was an increase in positive social and emotional behaviors throughout the nine-week period of the study. This study lends support to the idea that adding just fifteen minutes of joint music making experiences to early childhood classrooms may increase a sense of social connectedness among the students and increase prosocial behaviors.

Keywords: joint music making, prosocial behavior, preschool, musical play

Literature Review

The Essentialness of Social Connectedness

What really matters in the end? This is the discussion of Gawande's *Being Mortal* (2014). Gawande records an extensive study carried out by scholar Laura Carstensen in which it was discovered that human beings on multiple continents, regardless of age, come to the realization that when their time on earth is nearing its end, their focus begins to narrow. And nearly always, prominent in that vision, are relationships (pp. 96-99). It is not enough to achieve, acquire, or gain recognition. Human beings need connection.

Gawande likewise cites the research carried out by Harvard Medical School graduate, Bill Thomas, who found that despairing residents of a nursing home were revitalized when he brought in two dogs, four cats, and one hundred birds, as well as a living plant in each individual room. Thomas also provided a place for the staff's children to be cared for onsite, and thus, children also filled the newly installed playground at the facility. Thomas' research found that the opportunity for the residents to become contributing members of this living community was all they needed to resuscitate their behaviors and attitudes to that which resembled real living. A two-year study compared Thomas' nursing home with another control nursing home. The prescriptions required in the "living" facility fell to nearly half of that required in the control group. Total prescription costs fell to 38% and the total death rate percentage over that two-year period fell to 15% (p. 123).

Even when death is out of sight and out of mind Harvard philosopher, Josiah Royce, in his book, *The Philosophy of Loyalty* (1936), argues that people must have more than their basic needs of food, shelter and safety met. "[W]e all require devotion to something more than ourselves

for our lives to be enduring. To make life meaningful we must view ourselves as part of something greater: family, a community, a society” (cited in Gawande, 2014, pp. 126-127).

The aforementioned revelations provided by studying the elderly are similar to the findings provided by studying children, all kinds of children. Richard Lavoie has been an administrator for over twenty-five years at a residential program that seeks to meet the needs of students with learning disabilities. In his book, *It's so Much Work to be Your Friend* (2005), Lavoie shares how it is not uncommon for him to have a parent in his office in tears. But the tears that are shed for their child are never a result of their child's inability to master reading, writing, or mathematics. The tears flow because they have felt the pain of their child's experience of social isolation and rejection, of their child's inability to make or maintain friendships, of their inability to be received into the heart of the community in which they reside (pp. xxiv-xxv).

Lavoie reminds us that a variety of technologies, such as word processing systems and calculators, have been developed to help children struggling with academic deficiencies. But there is no accommodation for a child who lacks the ability to connect to a group in a meaningful way (p. xxix). Research has overwhelmingly shown the link between a child's ability to connect socially and their future success and happiness (p. xxx). If we as educators want to do a real service to our students, we must find ways for them to connect with others in meaningful ways.

One common strategy for helping students learn the skills necessary to connect with others is to allow them lots of time for free play, especially with other children. Guirguis in her study, “Should We Let Them Play? Three Key Benefits of Play to Improve Early Childhood Programs” (2018), asserts that it is during play that children learn to interact with others in a way that is socially acceptable (p. 45). Children who do not follow the rules of acceptable behavior risk not being allowed to continue playing with others. This provides strong motivation for developing

and conforming to social strategies which allow them to stay engaged with the group (p. 46). “Engaging in play allows children to teach themselves appropriate forms of self-regulating behaviors, which they will become aware of and apply in different settings” (p. 47). The more opportunity provided to practice these growing strategies, the better the children are prepared for future social interactions.

Spending time outdoors is another strategy claiming to bring much benefit to children. One of these claimed benefits is an improvement in social relationships. Time spent outdoors often provides extended unstructured play opportunities for children. This additional time of free play with peers is a frequently cited reason provided by researchers for the improved social relations connected with outdoor play (Jacob-Vessels, 2013; Martin, et al, 2018; Rosiek, et al, 2022). This further supports the research of Guirguis and others on the importance of play.

Another benefit from outdoor play which can contribute to improved social relations is a greater sense of peacefulness (Jacob-Vessels, 2014; Martin, et al., 2018; Rosiek, et al, 2022). Stress and irritability are contributing factors to anti-social behaviors. In his book, *Last Child in the Woods*, Richard Louv states that children “bring the confusion of the world to the woods and wash it in the creek” (Louv, 2005, p. 7). In the study “Perceptions of the Effect of Recess on Kindergartners” (Martin, et al., 2018) there was collective agreement that time spent outdoors through recess alleviated stress and excess energy, making children less irritable and allowing for calmer interactions with others (p. 250).

For many children more time in the great outdoors and extended periods of unstructured playtime will provide the opportunity needed to develop the skills required to form meaningful relationships. But for others these methods are not enough. For some students such scenarios are

opportunities for rejection and humiliation as they fail to crack the code to enter in (Lavoie, 2005, p. xxxviii).

For millennia, music has been a means of drawing people together and creating a sense of social connectedness. Through rituals of singing and dancing communities have come together to celebrate, worship, or even prepare for battle.

Social Connectedness and Music

Study after study has confirmed the ability of shared musical experiences to enhance the feeling of social connectedness. In a study of migrant children, a community in particular need of a sense of belonging, Rinde and Kenny (2021) explored music as a means of connecting these children to their new classmates. Even without a common language, shared music repertoire provided moments of connection for the children. Through synchrony to a common pulse, music provided another kind of connectedness. While dancing together children made eye contact and shared smiles. For some, this was the first classroom activity where they were able to really join in (p. 627).

Music has also been used to provide social connectedness to the elderly population. One study compared the experiences of three different senior groups. One group sang together in a choir. Another group exercised together while listening to music. And the third group engaged in discussion over current events, but with no musical content. The participants were observed and questioned to determine the effects of their participation on their emotional state and sense of social cohesion. All groups showed significant increases in each of these areas. But the two groups connected to music also showed a significant increase in positive mood and increased energy (Maury & Rickard, 2018).

Wills (2011), a primary music teacher, noticed positive changes in the behavior of certain children after joining her choir. This prompted a formal study which confirmed what she had suspected: the shared musical experience of choir enhanced a sense of well-being and personal growth in her children. But it also aided them in making social connections. All the children interviewed reported that it was easier to make friends in choir than on the playground. And if they were given a choice, they would come to choir every day, instead of playing outside (p. 43).

Development of Prosocial Behavior through Joint Music Making

Beyond experiences of social connectedness, collective music making is also being shown to promote prosocial behavior. “Discussions about the associations between collective music making and prosociality have been at the heart of recent research in music education, music therapy, developmental music psychology, and the evolutionary psychology of music” (Ilari, Helfter, & Huynh, 2020, p. 408). A landmark study by Kirschner and Tomasello (2009) showed the positive correlation between joint music making and prosocial behavior in four-year-old children who had participated in 3-minutes of interactive play using dancing, singing, and rhythm with an easy to learn children’s song. Each child was then tested on their willingness to help a partner and to cooperate with a problem-solving task. This was contrasted with a group of children who interacted with the same joint activity without the inclusion of the musical elements. The result of the study showed that while girls were more helpful than boys overall, those students who participated in joint music making showed more prosocial behavior than those who participated in the non-musical group (pp. 359-361).

Another study measured the prosocial task of helping another to reach a goal, called instrumental helping, along with the prosocial task of sharing. This study focused on three- and four-year-old children who had participated in different levels of music making, both in the home

and through participation in an early childhood music program (Ilari et al., 2020). The results of the study showed that there was no difference in these tasks based upon the sex or age of the children. There was, however, a positive correlation between these two prosocial behaviors and the level of engagement a child had with music making. Sharing, which is deemed a more challenging behavior than instrumental helping, was seen only as a positive correlation with active participation in music and not just through attendance in the early childhood music program. The children who had shown a greater propensity for sharing were reported to have daily engagement with music through singing, dancing and other forms of music making and listening.

While passive exposure to music has limited benefit, active participation in its various forms is significant. Winsler, Ducenne and Koury (2011) sought to understand the correlation between active participation in a formal music program which required children to regulate their movement through music, rhythm, tempo, and style, and those children's behavioral self-regulation in other arenas. This was measured objectively in a laboratory using a series of widely used inhibitory control tasks. The results showed a significant connection between those students currently enrolled in the music program and their ability to self-regulate. (p. 274)

The Significance of Rhythmic Alignment

Researchers continue to bore down into the reason why joint music making stimulates prosocial behavior. Essential to joint music making is alignment to a central beat. Wan and Zhu (2021) explore this aspect of music making and its influence on prosocial behavior by aligning dyads of children in a shared rhythm musical activity. All dyads played rhythm instruments along with a familiar tune. However, instead of playing the rhythm simultaneously, they played in alternation to each other. The children were divided into two different groups. In the first

group the children alternated playing their rhythm instruments every measure. This required the children to pay close attention to their partner and build upon his work. In the second group the children alternated rhythm every eight measures, in other words, at the completion of each musical phrase. In this scenario the children operated more independently and did not need to put as much focus on the rhythm making of their partner. Immediately following the musical game, the children were tested by being given an opportunity to help their partner complete a task, at a cost to himself. The children were also tested on their willingness to share stickers, which they had chosen for themselves, with a total stranger. Those children in the group which alternated every measure were more likely to help their partner, even at a cost to themselves, than were those who alternated rhythm at the end of the musical phrase, at 78% vs 44%. The one measure alternating group also outperformed the group alternating at the end of the musical phrase (75% vs. 49%) in donating their stickers to a stranger. This study lends support to the idea that not just joint music making, but a focus on joining together to a central beat, enhances prosocial behavior.

Rabinowitch and Meltsoff (2017) take this idea one step further by focusing on joint rhythmic movement of four-year-old children, without the element of music. In their study children were paired together through joint swinging. In one group the swinging was synchronized; another group swung in an asynchronous movement. Each group was tested immediately following the movement experience on the prosocial tasks of cooperation, sharing, and sense of fairness. The results of this study showed that a brief encounter between previously unacquainted four-year-old children in a synchronous activity was sufficient to alter their pattern of sharing and increase their ability to cooperate.

Are there other elements of music, besides synchronous movement that benefit children in their prosocial tasks? Williams (2018) argues strongly for coordinated movement activities in preschool children in her paper, “Moving to the Beat: Using Music, Rhythm, and Movement to Enhance Self-Regulation in Early Childhood Classrooms.” She records the findings of a large body of research which provides compelling evidence that trained musicians have enhanced skills in non-musical tasks. These tasks include language, cognition, and motor control, as well as enhanced neural plasticity and structural brain development. Williams states that “coordinated movement activities both *require* employment of the self-regulatory systems of the brain and *build* the neural circuitry relevant to self-regulatory functions (p. 94). Thus, by providing preschool children with the core experience of practiced rhythmic movement through music, it is possible that one could simulate some of the effects of this *musician advantage*, predominantly the effect of self-regulation, which is essential in carrying out prosocial tasks. Children as young as five to twenty-four months of age demonstrate a proclivity toward rhythmic movement and children three to four years of age are generally able to keep a consistent beat of their own preference. But adapting and synchronizing to a beat outside of oneself seemed to be beyond the reach of a child under five years of age of five (p. 88).

Kirshner and Tomasello (2009) challenge these findings in their study, “Joint drumming: Social context facilitates synchronization in preschool children”. In this study thirty-six children were asked to drum along with either a human partner, a visual drumming machine or the sound of a drum coming from a speaker. When drumming with a social partner, children as young as two and a half years of age were able to adjust their drumming tempo to that of their partner. (Kirshner & Tomasello). They were not able to synchronize their beat to the visual drumming machine or to the sound of a drum coming from a speaker. This shows that even a child as

young as two and a half years of age can benefit from synchronizing their movement to a beat, if the source of that beat is human partner.

Conclusion

Educators of preschool children feel the pressure to prove to parents and administrators their ability to develop academic skills, such as language and math development, in their students. Yet-few leaders seem to be looking over their shoulders to gauge their ability to help children grow in their capacity to connect with others. This is an essential need of humanity and without it, our lives lack purpose (Gawande 2014; Royce 1936, Lavoie 2005). For most children, school represents their primary activity and purpose. If a child continually experiences the pain of being unable to connect emotionally with his classmates in this environment, his ability to succeed academically, and in life, is greatly compromised (Lavoie pxxviii).

Many strategies have developed to try and meet this critical need in children. Shared music making experiences have consistently proven to be an effective means of creating the sense of emotional connectedness. (Rinde et al. 2021; Maury et al. 2018; Wills 2011). Beyond this, studies have confirmed the strong correlation of participation in joint music making emphasizing rhythm, with behaviors of self-regulation and prosociality (Ilari et al. 2020; Kirschner et al. 2009,2010; Winsler et al. 2011; Wan et al. 2021). Some even provide evidence that consistent participation in musical activities *builds* the neural circuitry relevant to self-regulatory functions (Williams 2018). This evidence lends thorough support to the idea that an emphasis on active consistent musical engagement in our early childhood classrooms would go a long way in helping our children to not only connect socially and find academic success in school, but also to build the habits and neural pathways that will sustain them physically and emotionally throughout their lives.

Theoretical Framework and Research Design

Over one hundred years ago, Dr Maria Montessori understood the importance of helping a child to connect with his peers and to live in harmony with his community. Montessori (1967) challenged the schools and educational systems of her day calling them repressive, almost to the point of slavery (p. 10). She believed that a truly scientific type of education was needed if children were to be helped in becoming the men and women who would take their contributive places in society. Montessori agreed with Wilhelm Wundt, the founder of psychological physiology, who believed that at that time children were virtually unknown (p. 42). Children needed to be observed and rediscovered if they were to be helped. And for children to be observed, they must be free (p. 46). Montessori believed that trying to understand children by observing them in a typical school setting where they are tied to a desk for long hours at a time was like trying to understand the nature of a butterfly which is dead and pinned to a board under a class cover. “It is imperative that a school *allow a child’s activities to freely develop*. For this is the essential change to be made if a scientific form of education is to come into being” (Montessori, 1967, p. 9).

Not only must children be free, but they must be placed in an environment where they can make visible their natural traits. Montessori (1967) considered the Prepared Environment to be “the most important and most pertinent to teaching since it [had] direct reference to a child’s vital activities” (p. 46). Montessori’s prepared environment included six vital components. One of these was the development of community life (Lillard, 1972, p. 51).

Montessori sided with American educator, Carleton Washburn, who argued that the “integration of the individual with his group must be cultivated in the schools, because it is just this that we lack, and the failure and ruin of our civilization is due to this lack” (Montessori,

1995, p. 234). Montessori (1967) understood that the period of three to six years of age was the time in which these qualities would develop, and this development would occur according to the nature of the child's surroundings (p. 227). She was thus careful to include within the child's surroundings, or environment, elements which addressed this essential potentiality in children. One example of this is her decision to have only one specimen of each object in the classroom. If this one object is in use when another child wants it, he must wait for it to be released. Through this the child comes to respect the work of others among other things. He must learn to wait his turn. "And since this happens every hour of the day for years, the idea of respecting others, and of waiting one's turn, becomes an habitual part of the life which always grows more mature" (Montessori, 1995, pp. 223-224).

We also see Montessori's value of the development of social life in her decision to include within the environment three age levels of children. In this environment the older children become protective of the younger children and are even given opportunities to teach them. The younger children look up to the older children and learn from them. All the children come to feel part of a group to which they contribute. This sense of community is of a high value to them, and they work at it earnestly. "Once they have reached this level, the children no longer act thoughtlessly, but put the group first and try to succeed for its benefit" (Montessori, 1995, p. 232).

Montessori was careful to prepare the environment in which the child was to freely move. She had observed in children the driving instinct to explore their environment. But within that environment there must be something which is interesting to the child, grabbing his attention. The matter of first importance for a child to develop, Montessori believed, was that he learns to

concentrate. “It lays the whole basis for his character and social behavior. He must find out how to concentrate, and for this he needs things to concentrate upon” (Montessori, 1995, p. 222).

That element which grabs the child’s attention is what Montessori referred to as the Point of Contact. “I believe that for mental development to take place it is necessary first to establish this point of contact between the soul of the child and an external reality... [And]it must always be accompanied by movement” (Montessori as cited in Standing, 1998, pp. 239-240).

Movement is an essential quality of Montessori’s approach to education. She believed it to be the basis for the development of his personality. “The child, who is constructing himself, must always be moving. ... If you wish to give the means to the child for his development you must give them in such a way that the child can and must move” (Montessori as cited in Standing, 1998, p. 230).

There are plenty of people who understand the need of children to move. It would be hard to find in our day a school for children of ages three through six who expect these children to remain seated at desks for long periods of time. Even our elementary schools recognize the importance of regular recess periods where children can run freely and play. But, according to Montessori, this type of movement has little to do with the development of the intelligence. For movement to have educational value there must be an end in view. Through movement the child must somehow build himself up; it must be an aid to his self-construction. “The movement is only creative when it enables the child to keep united his motor forces and his psychic life.” (Montessori as cited in Standing, 1998, p. 233)

Montessori herself illustrates how this phenomenon can be seen in a child’s relationship to music. She believed that music, along with everything else, could best be grasped through movement. With this end in mind, moving freely to music was a daily practice included in her

schools (Standing, 1998, p.241). She saw no value in teachers playing music while the children continued to move about any which way, in a disorderly and inharmonious fashion. The Point of Contact in this case is the musical rhythm which the children begin to bring their movements in alignment with - "thus establishing a psychic bridge between the soul of the child and the external reality of the music" (Montessori as cited in Standing, 1998, p. 240).

With the coming of the point of contact, however, we observed two very important changes. *First*, there is a limitation of his movements; and *secondly*, there is exactitude and precision. In the mental sphere an analogous process must take place. Before the establishment of the point of contact the child's mind wanders here and there turning now to this and now to that, "doing everything by fits and starts and nothing long," his movements being restless and uncoordinated. But with the establishment of the point of contact there results at once a limitation of the mental field, that is, a concentration on a definite aspect of reality, which is accompanied by a movement of exactitude and precision. The point of contact sets going "a movement in consciousness which can be described as the creation of something clear and definite, where before all was vague, formless, without precise outline....and now [the child] is on the road to the perfecting of himself." (Standing, 1998, p. 240)

Montessori was a strong advocate for the child. She believed that our duty towards him was, "in every case, that of helping him to make a conquest of such useful acts as nature intended he should perform" (Lillard, 1972, p. 53). As made clear above, Montessori believed that one of these "useful acts which nature intended" is that of learning how to live in harmony with others. But, according to Montessori (1967), a child does not necessarily come into this on his own. He must be guided towards the perfection of his being. This requires a carefully prepared

environment suited to the child where he can “pursue a series of interesting objectives and thus channel his random energies into orderly and well executed actions” (p. 62). Music can be an ideal way to provide this needed stimulus for the child, for “the child has an instinct to coordinate his movements and to bring them under control” (Montessori, 1995, p.179). Through music a child can learn to coordinate his movement, and thus his mind, and in the process lead himself to take possession of his body and become a man or woman prepared to take his place as a contributing member of society.

Research Design

Setting and Methodology

The setting for my study was my own small private Montessori classroom, an environment thoughtfully prepared for a child to freely explore and use for the perfecting of himself and as an aid for the development of his community life. The methodology for my research was essentially a case study that focused on an individual child who struggled with social relationships. Though a single case study, the child’s interactions were observed alongside with and in relationship to the other five members of the classroom. At the time of the study the focus student was in his first year of school at a 3k level. The previous year, three of the other students had attended this school together. The two remaining students, who were new to the classroom along with the focus student, were a brother and a cousin of a returning student. The focus child, who was the only student without another relation in the class, had some limited interaction with other classmates in a Sunday School setting. All the students attended school four days a week, Monday through Thursday, from 8:15 to 11:15 am.

Rationale for and background to the case study approach

Before the school year had begun, I had been made aware that the student on whom this study focused was having trouble assimilating to the church childhood setting. It was reported that he was consistently uncooperative with others, didn't listen to the teacher, would run from the classroom if given the opportunity, and even once tried to choke a child. The first week that he was in my classroom was similar in that he did not listen to or respond to what I asked him to do and was uncooperative with the other students. One day, because of his complete lack of cooperation, his mother was called to come and pick him up. After that, there was some improvement in his willingness to cooperate, though integration with the other students was not something that came easily for him, nor did he appear to show interest in it.

While playing musical games with the students in the classroom I noticed that the focus student would light up and become interested and engaged. Here was my Point of Contact! And here was the opportunity for my child to engage, not only in music as Montessori encouraged, but also in an experience which required concentrated effort towards social engagement.

Research question

This phenomenon of enthusiasm and engagement during music birthed my research question: How would providing a daily session of joint music making in my classroom impact my subject's sense of well-being and prosocial behavior? Through my own investigation, I discovered that the association of shared musical experiences and its social effects had been well researched. There was plenty of evidence showing a direct correlation between joint music making and prosocial behavior. I was encouraged to conduct my own study, adding a regular joint music making session to my classroom and noting its impact on my focus student.

I chose to conduct a nine-week study which consisted of two weeks of daily joint music making sessions followed by a week of no joint music making sessions, other than a morning greeting song and a sung prayer before snack, which continued through every week of the study. This two weeks on, one week off pattern repeated itself two more times, creating a nine-week study. The study includes 6 participants ages four through six. As mentioned, this small full Montessori setting is a morning only program that lasts three hours followed by the children returning home.

Music intervention schedule

Before the beginning of this study, there had been some shared music making experiences in the classroom. Each day I would start the day with a greeting song and then I would allow one child to pick their favorite song for us to sing together. Every week or two I would introduce a new song to add to our repertoire. Later in the morning we also sang a prayer together before our snack. For the study I chose to increase the joint music making session by 15-20 minutes each day. I intended to end the session early if the students began to lose interest, allowing them to remain free. Other than an individual who might sit out for one or two of the songs, there was never a loss of interest by the students in the joint music making adventures.

During the musical sessions, which most often occurred during our regular morning line time at the beginning of the day, we would typically sing songs which the children chose, each one taking their own turn. Occasionally, I would make the choice or introduce a new song. Of all the songs that were introduced *Blue Bird Blue Bird Through My Window* was the hands down favorite. During this song the children would weave in and out of the windows, or the upraised arms of the other students, always choosing another bluebird to come along until there

were only two students left making a window. *The Farmer in the Dell* was another favorite. Because of the small number of children in the classroom, this song began with everyone sitting on the ellipse, instead of joining together in a circle. The “farmer” went to the middle of the ellipse and called his “wife”. She would join him in the center. Joining hands, they would turn in a circle calling the child, the dog, the cat, etc. After all had been called to the middle, each would take their turn running back home. This always brought squeals of laughter. But the favorite part of all was when the farmer stood alone, and we all cried together as we sang about the lonely farmer.

Part way through the study I brought in rhythm instruments to play. These included drums, rhythm sticks, egg shakers and frog guiros. After giving lessons on how to use these instruments, we practiced using them with the rhyme *Bee Bee Bumble Bee* and the familiar song *Jingle Bells*. After the rhythm instruments had been introduced, the children were given the option to do their song with either rhythm instruments or with actions. Several days following the introducing of the rhythm instruments, rhythm was the option of choice. But soon the children returned to singing their songs with actions.

Another type of musical activity we enjoyed were call and response songs. In these songs I would sing a line of music and then the children would echo it back. *We're Going on a Bear Hunt* was the favorite of this type of song, as well as a song I made up about Land, Air and Water. Most other songs we enjoyed during our nine-week study were action songs like Head, Shoulders, Knees and Toes, which we sang while standing on the ellipse.

During weeks three, six, and nine of the study the only shared musical experiences were the morning greeting song and the sung prayer. Once or twice during the off weeks, the children

spontaneously sang and played their own musical games together apart from me. When this occurred, I did not stop it.

Instruments

Guided by Montessori's emphasis on discovery through observation, I decided to use an in-class observation instrument for my research. Being the only adult in the classroom, I knew that I would not be able to devote a lot of time to narrative recordings of my observations. Instead, I created a tally sheet listing specific positive and negative social and emotional behaviors (Appendix D: In Class Tally of Observed Social and Emotional Behaviors). Throughout the morning I would be able to quickly record, with a tally mark, any of the behaviors which I observed. I considered positive interactions such things as helping, sharing, or using kind words. Negative behaviors included such things as disrespecting a child's space or belongings, inappropriate touching, unkind words or tone of voice. My responses were guided by what I thought would be considered good manners in our current American culture. Appropriate ways of trying to join in with others might include things like asking, or silently watching until asked to join in, or even by smiling and trying to participate. Negative ways of trying to join others might include grabbing, or inappropriate touching, or even trying to be funny, but in a way that is hurtful or disrespectful to others. An additional observation instrument (Appendix F: Observation Record) was used to record any other information that may have influenced the child's behavior that day, or if the quality of one of the tallied behaviors was notable and would benefit from further elaboration.

Another observational instrument I devised was a short five-question survey to be filled out by the student's mother immediately following pick up each day throughout the nine-week

period (Appendix C: Survey of Social Behavior at Time of Pickup). I even encouraged the mother to complete the survey immediately upon pulling into the driveway, before exiting the vehicle. This survey recorded observations of the child's behavior, attitudes, and conversations during the fifteen-minute car ride home from school each day of the study. The mother noted the child's level of cooperation, the child's mood, and instances of expressed empathy or interest in fellow classmates.

The final instrument I devised was the Parental Pre and Post Survey (Appendix E). This survey was used to gather information concerning the child's previous participation in formal music classes and his participation in musical experiences in the home. This parental survey also asked questions concerning the child's current level of prosocial behaviors in the home. Expressions of empathy, sharing, cooperation, as well as expressions of positive and negative emotions, were measured according to their frequency of display. Options such as *daily*, *several times a day*, *several times a week*, *weekly*, *seldom*, or *not at all* were given to the parent.

At the conclusion of the study the mother was once again asked to rate the frequency of these same prosocial and emotional behaviors in the home, using the same scale. This provided a measurement to discern if there was any positive correlation between the nine weeks of the joint music making in the school and the child's prosocial and emotional behavior in the home.

Data Analysis and Discussion

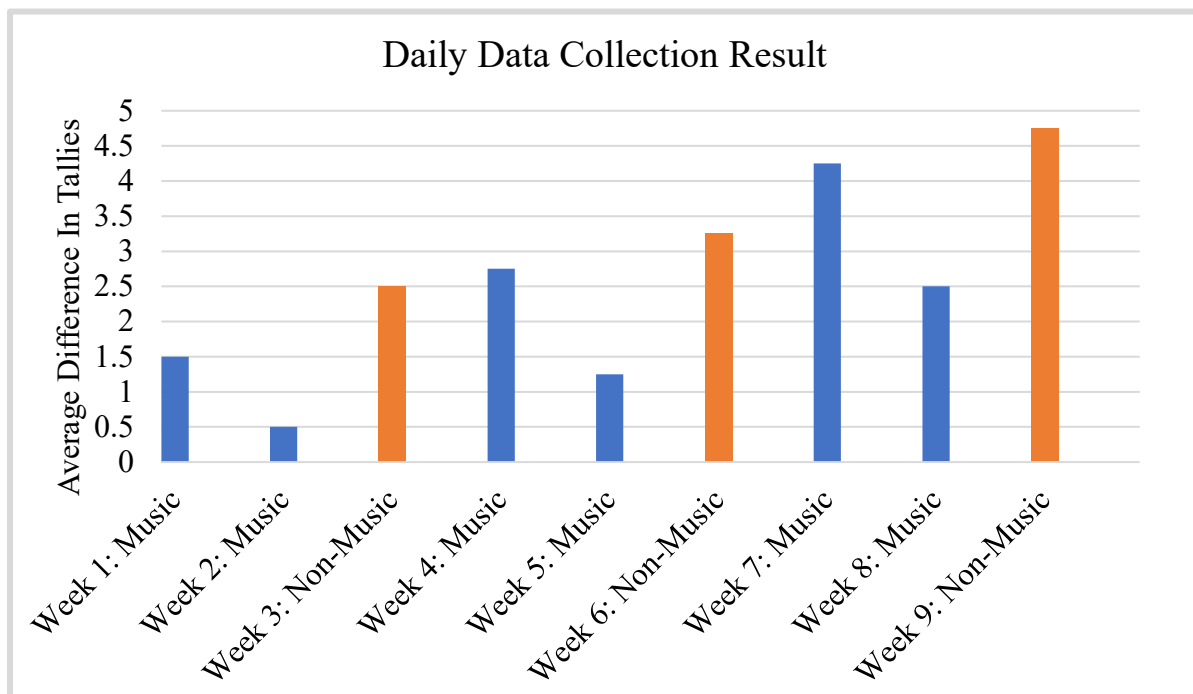
Results

At the conclusion of the nine-week study, I used the data from Instrument 2: In Class Tally of Observed Social and Emotional Behaviors (Appendix D) to create a daily base score. I did this by subtracting the negative behavior tally marks from the total number of positive

behavior tally marks. The scores of each day were then averaged together to get a base score for each week of the study. These weekly averages were graphed on a bar chart to visually compare the music weeks with the non-music weeks to see if there was a correlation between positive behaviors and daily joint music making experiences.

Figure 1

Daily Data Collection Result

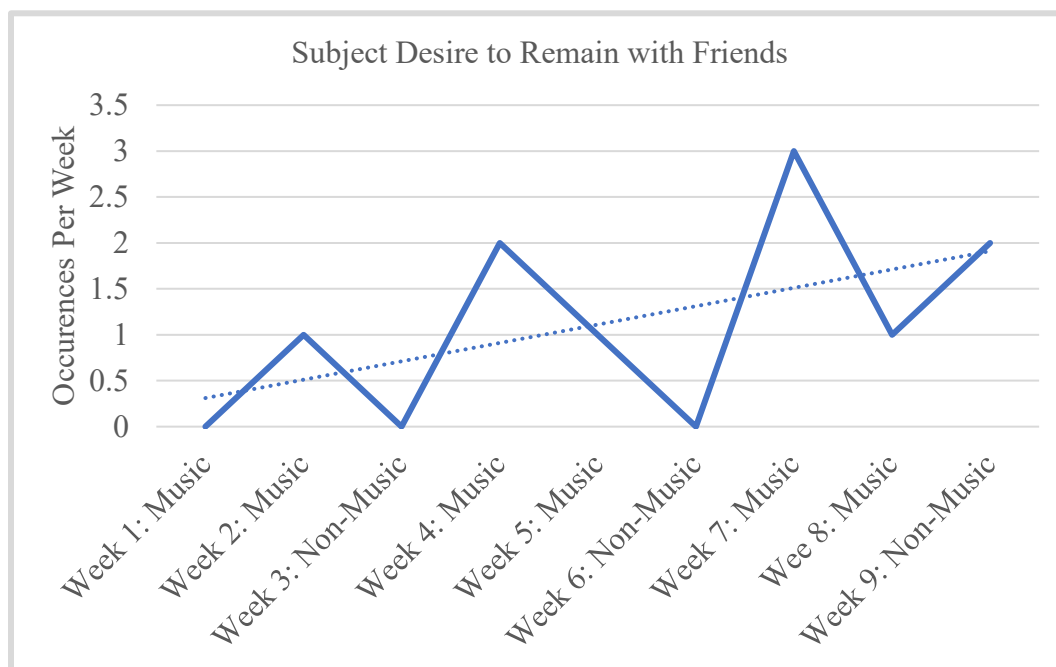


The data from the In Class Tally showed that there was an overall gradual increase in positive behaviors throughout the nine-week study. The highest number of positive behaviors occurred during the third week of each three-week cycle. This was the week in which there were no joint music making sessions. The lowest number of positive behaviors occurred during the second week of each cycle. This was the second of the two joint music making weeks. These results will be discussed below.

When the data from Instrument 1: Survey of Social Behavior at Time of Pick Up (Appendix c) was analyzed there was no correlation found between the joint music making sessions and the child's mood, positive or negative conversations about other students, or indications of empathy. There was, however, a correlation in how often the child chose not to come directly to the car after school the first time he was called. This was interesting. I had assumed that if the child's ability to self-regulate increased through the joint music making sessions, he would begin coming to the car, more often, the first time he was called. Instead, he began coming less often. The reason for this change seemed to be an increased desire to spend time with his friends, which showed an increased ability or desire to connect socially. Figure 2 shows there was a gradually increasing trend over the course of the study of the child desiring to remain in community with his friends, instead of immediately getting into the car at the end of the school day the first time he was called.

Figure 2

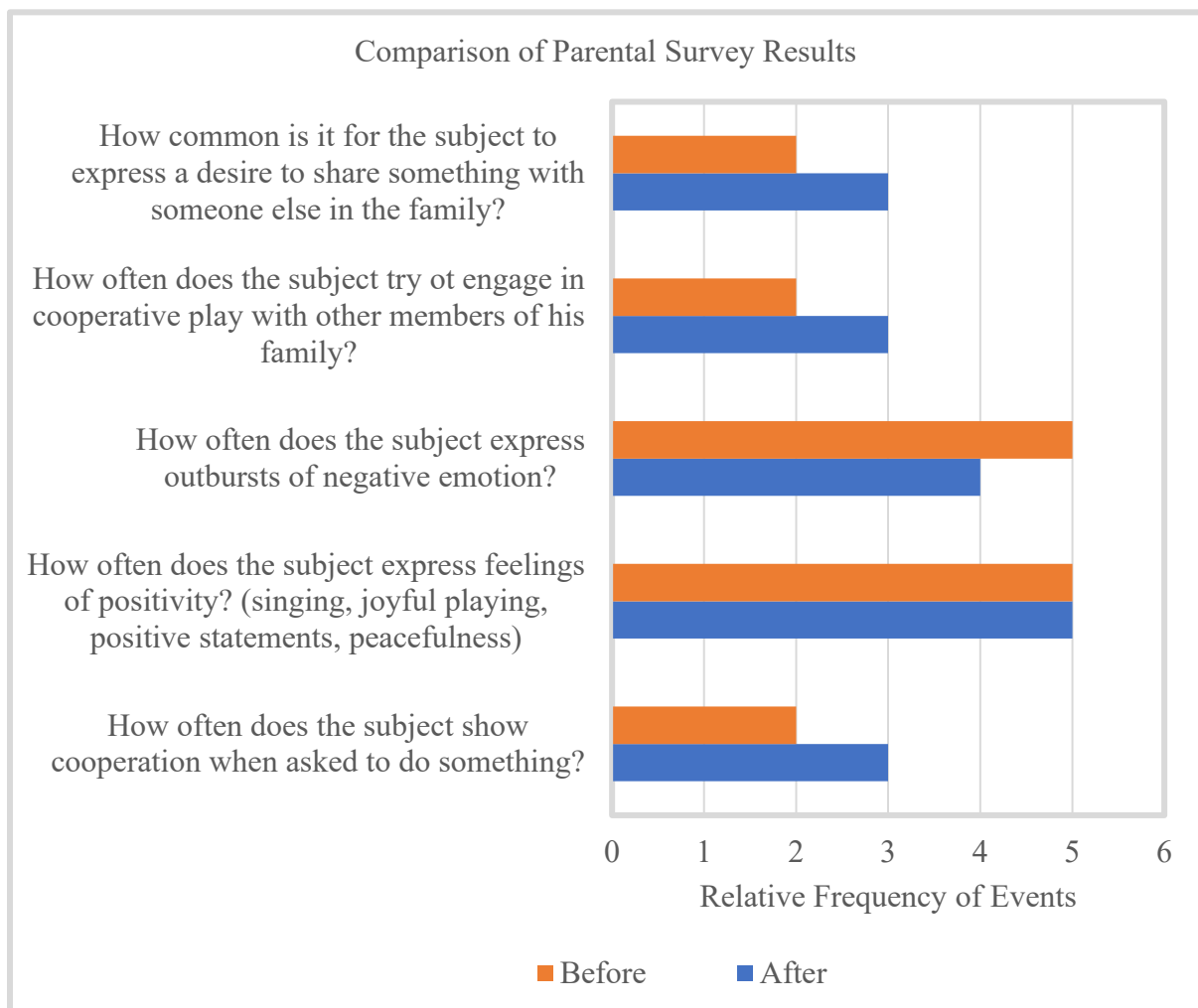
Subject Desire to Remain with Friends



The data collected from the Parental Pre-Survey was compared to the data collected from the Parental Post-Survey (Appendix E). It was shown that over the course of the study the child's positive behavior improved in every category except for the one category in which he had already been marked at the highest level: expressing feelings of positivity. This category remained the same. Though the third item on the graph appears to show a decrease, it should be noted that the decreased behavior is a decrease in negative emotional outbursts, which makes it an increase in positive behavior.

Figure 3

Comparison of Parental Survey Results



Discussion

Because of my previous research about the strong correlation between shared musical experiences and positive social outcomes, I expected to see at least some positive results in my own study. However, at first this did not appear to be the case because as I was collecting the data, specifically the tally marks, I noticed that there were increased positive behaviors during the non-joint music making weeks. Based on the research, I thought I would see positive results during the joint music making weeks which the findings were not yielding. Therefore, I assumed that at the conclusion of my study I would see no correlation between the joint music making sessions and the subject's prosocial behavior. However, since I had not read any of the parental surveys, I did not make any other conclusions.

After all my data was collected and analyzed I realized that results considered by each week, or by music or no music weeks, were not as profound as that of the cumulative results of the full nine weeks. In fact, when considered over the full length of the study, I was able to see that there was indeed a positive correlation between the joint music making sessions and my subject's positive social and emotional behavior. The positive correlation was consistent between three different instruments of data collection: Instrument 1 The Survey of Social Behavior at time of Pick Up, Instrument 2 In Class Tally of Social and Emotional Behaviors, and Instrument 3 Parental Pre and Post Surveys. For example, Instrument 1 showed that over the course of the study the students desire to socialize with friends after school increased. Instrument 2 showed that there was an increase in positive social and emotional behavior in the classroom. And Instrument 3 showed that there was an improvement in the child's social and emotional behavior in the home. The fourth instrument, Observation Record, (Appendix F) included descriptive narrative of the quality of some of the positive behaviors seen in the classroom (Appendix H).

Only one comment showed that there was improvement in positive social behavior over time. This was a comment made about the focus child by another student in the classroom.

When the focus child came into school today another student told me about how that focus child used to be mean but now, he's learned how to be a good friend. The focus student asked that child for a hug and they gave each other a nice hug. The two of them spent a lot of time playing together in the play area.

There is no indication, however, that this was an improvement which occurred over the course of the nine-week study or since the beginning of the year.

The data of the instruments showed that the positive effects of the study were cumulative, over the course of nine-weeks, and not correlated to specific music or non-music making days or weeks. This seems to be consistent with the discovery made by Winsler, Ducenne, & Koury (2011), which showed that the benefits of early music and movement classes linger for months following the final class session. It is, therefore, reasonable to assume that the positive effects of the joint music making weeks would carry over into the non-joint music making weeks.

Limitations and Further Steps

There were two limitations of which I became aware as I was conducting my study. The first of these was my inability to make undistracted observations as the only adult in my classroom. Although there were only six students and the classroom was small, I was often distracted by the other children and certain classroom activities. This kept me from keeping a careful watch of my subject's behavior. There were many times when behaviors, positive or negative, may have been missed. In the future, when this type of study is conducted, I need to consider having an additional observer in the classroom who can collect data while not being distracted by other classroom responsibilities.

The second limitation of this study was the significant improvement in the focus child's social and emotional behavior which had already taken place before the study began. At the time of the study the children had already been working in community for three months. During this three-month period there was observable growth in the focus child's social and emotional behavior. There are many reasons this growth could have taken place. There were already joint music making sessions taking place in the classroom before the study began. These sessions were not as long as the joint music making sessions during the study, but they still could have had an impact. The child's behavior may also have been impacted by the structure and consistency he experienced in the classroom, or by the warmth and affection he experienced from me. It is not clear why his behavior had improved but it clearly did. Therefore, the improvement that continued throughout this study could have been the result of these other factors and not the increased joint music making sessions.

If the study would have continued to the end of the year and all joint music making sessions were eliminated after the initial nine weeks, there could have been added data which might have shown some significance to the study. Although there is a possible residual effect remaining after the joint music making sessions have ceased, it would be notable if there was an eventual decline in positive behaviors while all other conditions in the classroom remained the same. Continuing to collect data for an extended period following the cessation of the joint music making sessions would be a significant improvement to this study in the future.

As a result of this study, I created a music area in the classroom which housed the rhythm instruments and the Montessori Bells. The children were free to use this area alone or with friends throughout the morning. Going forward it would be beneficial to design specific works for this area using such tools as a metronome or Note Knacks.

Conclusion

Based upon the results of the data collected throughout this study, there appears to be a correlation between my subject's time spent in joint music making sessions and his improved social and emotional behaviors in the classroom, as well as in the home. Positive behaviors such as seeking out other children to work with, seeing a desire in other children to work with the subject, along with other positive interactions have increased in the classroom. In the home the parents have seen an improvement in the child's ability to cooperate, empathize with others, seek out family members for cooperative play, and a decrease of incidents of negative emotional outbursts. These positive behaviors grew over the course of the whole nine-week study and were not directly related to the particular day or week in which the joint music making sessions were taking place. In fact, some of the highest incidences of positive behaviors occurred during the weeks when there were no joint music making sessions happening. It is also not clear whether the improved behavior in the focus child was due to the increased joint music making sessions or if it was a continuation of improvement that had already been occurring in the classroom for unknown reasons. Though there has been much research done which confirms the correlation between shared musical experiences and prosocial behaviors, more research would need to be done to confirm the validity of the correlation seen in this particular study.

References

- Gawande, A. (2014). *Being mortal: Medicine and what matters in the end*. Metropolitan Books.
- Guirguis, R. (2018). Should we let them play? Three key benefits of play to improve early childhood programs. *International Journal of Education and Practice*, 6(1), 43–49.
<https://doi.org/10.18488/journal.61.2018.61.43.49>
- Hayward, S. M., Raine, M., & Thompson, G. (2022). A sense of belonging: Feasibility study exploring wellbeing outcomes of music-making workshops for autistic young adults. *Australian Journal of Music Therapy*, 33(1), 24-.
- Ilari, B., Helfter, S., & Huynh, T. (2020). Associations between musical participation and young children's prosocial behaviors. *Journal of Research in Music Education*, 67(4), 399–412.
<https://doi.org/10.1177/0022429419878169>
- Jacobi-Vessels J.L. (2013). Discovering nature: The benefits of teaching outside of the classroom. *Dimensions of Early Childhood*, 41(3), 4-10.
- Kirschner, S., & Tomasello, M. (2009). Joint drumming: Social context facilitates synchronization in preschool children. *Journal of Experimental Child Psychology*, 102(3), 299-314. <https://doi.org/10.1016/j.jecp.2008.07.005>
- Kirschner, S., & Tomasello, M. (2010). Joint music making promotes prosocial behavior in 4-year-old children. *Evolution and Human Behavior*, 31(5), 354-364.
<http://doi.org.ezproxy.uwrf.edu:2048/10.17605/OSF.IO/6UQ5C>.
- Lavoie, R. D. (2005). *It's so much work to be your friend: helping the child with learning disabilities find social success*. Simon & Schuster.
- Louv, Richard. (2008). *Last child in the woods: saving our children from nature-deficit disorder*. (Updated and expanded.). Algonquin Books of Chapel Hill.

- Martin, H., Farrell, A., Gray, J., & Clark, T. B. (2018). Perceptions of the effect of recess on kindergartners. *The Physical Educator*, 75(2), 245–254. <https://doi.org/10.18666/TPE-2018-V75-I2-7740>
- Maury, S., & Rickard, N. (2018). A comparison of the effects of short-term singing, exercise, and discussion group activities on the emotional state and social connectedness of older Australians. *Music & Science*, 1. <https://doi.org/10.1177/2059204318800607>
- Morrier, M. J., & Ziegler, S. M. T. (2018). I wanna play too: Factors related to changes in social behavior for children with and without autism spectrum disorder after implementation of a structured outdoor play curriculum. *Journal of Autism and Developmental Disorders*, 48(7), 2530–2541. <https://doi.org/10.1007/s10803-018-3523-z>
- Rabinowitch, T.-C., & Meltzoff, A. N. (2017). Joint rhythmic movement increases 4-year-old children's prosocial sharing and fairness toward peers. *Frontiers in Psychology*, 8, 1050–1050. <https://doi.org/10.3389/fpsyg.2017.01050>
- Rabinowitch, T.-C., & Meltzoff, A. N. (2017). Synchronized movement experience enhances peer cooperation in preschool children. *Journal of Experimental Child Psychology*, 160, 21–32. <https://doi.org/10.1016/j.jecp.2017.03.001>
- Rinde, F. B., & Kenny, A. (2021). Music in the school life of newly arrived migrant children: Potential paths to participation and belonging. *Music Education Research*, 23(5), 622–633. <https://doi.org/10.1080/14613808.2021.1993165>
- Rosiek, M.A., Etnier, J.L., Willoughby, M.T. (2022). A comparison of the effects of outdoor physical activity and indoor classroom-based activities on measures of executive function in preschoolers. *International Journal of Early Childhood*, 4(2), 203-215. <https://doi.org/10.1007/s13158-022-00328-x>

Royce, J. (1936). *The philosophy of loyalty*. The Macmillan Company.

Wan, Y., & Zhu, L. (2021). Effects of rhythmic turn-taking coordination on five-year-old children's prosocial behaviors. *Developmental Psychology*, 57(11), 1787-1795.

<http://doi.org.ezproxy.uwrf.edu:2048/10.17605/OSF.IO/6UQ5C>

Williams, K. E. (2018). Moving to the beat: Using music, rhythm, and movement to enhance self-regulation in early childhood classrooms. *International Journal of Early*

Childhood, 50(1), 85–100. <https://doi.org/10.1007/s13158-018-0215-y>

Wills, R. (2011). The magic of music: A study into the promotion of children's well-being through singing. *International Journal of Children's Spirituality*, 16(1), 37–46.

<https://doi.org/10.1080/1364436X.2010.540750>

Winsler, A., Ducenne, L., & Koury, A. (2011). Singing one's way to self-regulation: The role of early music and movement curricula and private speech. *Early Education and*

Development, 22(2), 274–304. <https://doi.org/10.1080/10409280903585739>

Appendices

Appendix A: *IRB Approval Document*



IRB #: IRB-FY2023-168

Title: Dinkler. Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Creation Date: 12-4-2023

End Date:

Status: **Approved**

Principal Investigator: Kateri Carver

Review Board: UW Institutional Review Board

Appendix B: Informed Consent**Informed Consent for Research Participation-Parent****IRB # IRB-FY2023-168****IRB Approval Date:** 02-05-2024

Study Title: Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Researcher Names	Department	Contact Information
1. Cynthia Dinkler	TED	cynthia.dinkler@my.uwrf.edu
2. Kateri Carver	TED	kateri.carver@uwrf.edu

We are asking you to fill out a survey at the beginning and at the end of our study. Participation is voluntary and you may stop at any time. If you choose not to participate or stop participating, there will be no negative consequences to you or your child. Participating will not change anything about your relationship with the researchers or our department. Participating or not participating will not change any services you receive from [REDACTED].

Overview of the Research

Purpose of the Study	The purpose of this study is to determine if there is a positive correlation between joint music making experiences of the children in our classroom and their prosocial behavior.
What you will be asked to do	You will be asked to fill out and return a survey at the beginning and at the end of our study. You will also be asked to respond to a quick five question survey, requiring you to circle an answer, each school day during the nine-week study.

Amount of time it will take you to participate	The pre and post surveys will take five to ten minutes. The daily survey can be done in under a minute. The study continues for nine-weeks.
Risks to you if you choose to participate	The risk of participation is minimal. There may be some discomfort in answering the questions honestly if there is a fear that you may be, or your child may be, looked upon in a negative way because of your responses.
What we will do to reduce the risks	We will allow you to skip any questions which you do not feel comfortable answering. All data will be confidential and only seen by the researcher.
Benefits to you or others if you choose to participate	You may find a positive correlation between shared music making and your child's social and emotional well-being and thus decide to provide your child with more musical experiences.

Confidentiality and Data Protection

Who will see my answers/information?	All information gathered will be confidential and will be seen only by myself and my fellow researchers. The results of the study will be communicated in such a way as to protect the identity of particular students.
Where will my answers/information be stored?	All filled out surveys will be returned in a sealed envelope and will be stored in a lockbox outside of the classroom after the envelopes have been opened. Electronic information will be stored on my password protected computer.
How will my answers/information be protected?	All answers will be protected by being stored in a lockbox outside of the school room or on a password protected computer.

Protection of Human Research Subjects

If I have questions about this research, I should contact:	One of the researchers listed above.
If I have questions or want to complain about my rights or how I was treated as a research participant, I should contact:	Institutional Review Board Chair University of Wisconsin River Falls 410 S. Third St. River Falls, WI 54022 715-425-0629 irb@uwrf.edu

Signatures:

I agree / I disagree (please circle one) to participate in this study and understand that my child may quit at any time and/or skip or refuse to answer any questions.

 Printed Name of Participant

 Signature of Participant

Informed Consent for Research Participation-Child

IRB # IRB-FY2023-168

IRB Approval Date _____

Study Title: Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Researcher Names	Department	Contact Information
1. Cynthia Dinkler	TED	cynthia.dinkler@my.uwrf.edu
2. Kateri Carver	TED	kateri.carver@uwrf.edu

We are asking that your child participate in our research study. Participation is voluntary and you may stop at any time. If you choose not to have your child participate or stop participating, there will be no negative consequences to you or your child. Participating will not change anything about your relationship with the researchers or our department. Participating or not participating will not change any services you receive from Mimi's Montessori Christian Academy.

Overview of the Research

Purpose of the Study	The purpose of this study is to determine if there is a positive correlation between joint music making experiences of the children in our classroom and their prosocial behavior.
What you will your child be asked to do	Your child will be encouraged to participate in an extended period of singing, musical games, and rhythm making.
Amount of time it will take your child to participate	The shared music experience will extend our morning gathering time by an additional ten to twenty minutes, or as long as the children are showing interest.
Risks to your child if you choose to allow them to participate	The risks of participation are minimal, no more than is typical in their daily classroom routine. There could be some discomfort in feeling pressure to stay and participate in music when they would like to continue with their morning routine.
What we will do to reduce the risks	I will allow the children to move on to other work when they show a loss of interest in the music making.
Benefits to your child or others if you choose to have them participate	Many studies are showing the benefit of joint music making experiences and participation in music, in general. In the very least, shared musical experiences bring about a feeling of social connectedness. But these experiences with music are also being shown to increase a child's prosocial behaviors such and sharing and helping.
Compensation offered to you for participating	There is no compensation for participation in this study.

Confidentiality and Data Protection

Who will see my child's information related to this study?	All information gathered will be confidential and will be seen only by myself and my fellow researchers. The results of the study will be communicated in such a way as to protect the identity of particular students.
Where will my child's information be stored?	All data will be stored in an envelope in a lockbox in my home, outside of the classroom, or on my password protected computer.
How will my child's information be protected?	All information will be stored on my password protected computer or in an envelope in a lockbox in my home.

Protection of Human Research Subjects

If I have questions about this research I should contact:	One of the researchers listed above.
If I have questions or want to complain about my rights or how I was treated as a research participant I should contact:	Institutional Review Board Chair University of Wisconsin River Falls 410 S. Third St. River Falls, WI 54022 715-425-0629 irb@uwrf.edu

Signatures:

I agree / I disagree (please circle one) to have my child participate in this study and understand that my child may quit at any time and/or skip or refuse to answer any questions.

If participant is a minor or requires a Legally Authorized Representative:

Printed Name of Parent, Guardian or Legally Authorized Representative

Signature of Parent, Guardian or Legally Authorized Representative

Date

Appendix C: Instrument 1

Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Instrument 1: Survey of Social Behavior at Time of Pickup

IRB# FY2023-168

Approval date: 02-05-2024

Directions

1. Every day at pick up you will be handed this survey in a closed manila envelope.
2. Please read through the survey to know which behaviors you are observing.
3. When returning home, before exiting the car, please take a minute to circle all appropriate answers to each question.
4. Return the document to the manila envelope and leave it in the car.
5. When returning to school the next day, please send the envelope containing the document in with your child.

Rating Scale for Pickup:

1. Did the subject listen and respond to you the first time you asked him/her to get into the car?

Yes No N/A I don't remember

2. If the subject did not respond the first time you asked him/her to get into the car was it due to his/her interaction with, or a seeming desire to interact with his/her classmates?

Yes No N/A I don't know I don't remember

3. On the ride home did the subject seem

Happy Content Sad Mad Other

4. On the ride home did the subject talk about classmates? Yes No

In a positive way? Yes No

In a negative way? Yes No

5. On the ride home did the subject make any comment that showed that he/she was aware of another person's feelings at school?

Yes

Appendix D: Instrument 2

Title of study: Joint Music Making in a Montessori Classroom: Is There a Correlation Between
Joint Music

Making and Prosocial Experiences?

Instrument 2: In Class Tally of Observed Social and Emotional Behaviors

IRB# FY2023-168

Approval date: 02-05-2024

Directions

1. Please read through the below document to be aware of behaviors that you are to observe in the classroom.
2. Each day during the study please date and use a new tally document.
3. During each school day of the study, please observe the subject and place one tally mark beside each behavior listed below, only if you see it occur in the classroom.
4. Please note: some behaviors may have more than one tally mark each day. Others may receive no tally mark.
5. Please return the document to the proper envelope at the end of each day.

Date: Filled out by:

Asks to work with a friend: Positive response Negative response No Response

Tries to join in with others: Appropriately Inappropriately Neutral

Other positive interaction with another student

Other negative interaction with another student

Comments about or to another student: Positive Negative

Positive social contact initiated by another child: Positive response Negative Response
Emotional outburst

Appendix E: Instrument 3

Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Instrument 3: Parental Pre and Post Survey

IRB# FY2023-168

Approval date: 02-05-2024

Directions

1. Please answer the following questions to the best of your ability by either circling the response which most closely responds to your experience or by filling in the asked for information.
2. You may skip any questions you do not feel comfortable answering.
3. When the survey is completed, please place it in the envelope you received it in, seal it and return it with your child to school.

Date: _____ Filled out by: _____

Before:

1. Prior to this study has the subject had any formal musical training? Yes No
 If yes, please describe the training and the length of time the subject has participated.
 Is the subject currently receiving this formal training? Yes No
2. Prior to this study has the subject participated in any type of music class such as Kindermusik?
 Yes No
 If yes, please indicate the name of the class and the length of time the subject was enrolled.
 Is the child currently enrolled in this music class? Yes No
3. Before beginning this study has the subject been sung to in the home?

Daily Several times a day Several times a week Weekly Seldom Not at all

4. Before beginning this study has the subject had musical experiences in the home (listening to music, creating music, singing, dancing, etc.)?

Daily Several times a day Several times a week Weekly Seldom Not at all

5. How often does the subject show awareness of negative emotions expressed by other members of the family (sadness, frustration, hurt, etc.)?

Usually Sometimes Rarely Never

6. How common is it for the subject to express a desire to share something with someone else in the family?

Usually Sometimes Rarely Never

7. How often does the subject try to engage in cooperative play with other members of his family?

Daily Several times a day Several times a week Weekly Seldom Not at all

8. How often does the subject express outbursts of negative emotion?

Daily Several times a day Several times a week Weekly Seldom Not at all

9. How often does the subject express feelings of positivity? (singing, joyful playing, positive statements, peacefulness)?

Daily Several times a day Several times a week Weekly Seldom Not at all

10. How often does the subject show cooperation when asked to do something?

Usually Sometimes Rarely Never

After:

Date: Filled out by:

1. Prior to the study you responded _____ to the question *How often does the subject show awareness of negative emotions expressed by other members of the family (sadness, frustration, hurt, etc.)?* How would you respond to that question now?

Usually Sometimes Rarely Never

2. Prior to the study you responded _____ to the question *How common is it for the subject to express a desire to share something with someone else in the family?* How would you respond to that question now?

Usually Sometimes Rarely Never

3. Prior to the study you responded _____ to the question *How often does the subject try to engage in cooperative play with other members of his family?* How would you respond to that question now?

Daily Several times a day Several times a week Weekly Seldom Not at all

4. Prior to the study you responded _____ to the question *How often does the subject express outbursts of negative emotion?* How would you respond to that question now?

Daily Several times a day Several times a week Weekly Seldom Not at all

5. Prior to the study you responded _____ to the question *How often does the subject express feelings of well-being (singing, joyful playing, positive statements, peacefulness)?* How would you respond to that question now?

Daily Several times a day Several times a week Weekly Seldom Not at all

6. Prior to the study you responded _____ to the question *How often does the subject show cooperation when asked to do something?* How would you respond to that question now?

Usually Sometimes Rarely Never

Appendix F: Instrument 4

Joint Music Making in a Montessori Classroom: Is There a Correlation Between Joint Music Making and Prosocial Experiences?

Instrument 4: Observation Record

IRB# FY2023-168

Approval date: 02-05-2024

Directions

1. For each day of the study use a new copy of this form.
2. Date the form and sign your name.
3. Each day of the study record any relevant observations you have made about the subject's behavior during the music making session or throughout the morning.
4. At the end of the morning return the observation sheet to the assigned manila envelope.

Observation:

Appendix G: Raw Data Daily Tally Sheets

Daily Tally Sheets			
Date	Positive Tallies	Negative Tallies	Difference
1/22/24	4	1	3
1/23/24	4	0	4
1/24/24			0
1/25/24	1	2	-1
1/29/24	5	3	2
1/30/24			0
1/31/24			0
2/1/24			0
2/5/24	3	2	1
2/6/24	5	0	5
2/7/24	3	0	3
2/8/24	3	2	1
2/12/24	2	1	1
2/13/24	4	0	4
2/14/24	3	1	2
2/15/24	5	1	4
2/19/24	4	2	2
2/20/24	4	0	4
2/21/24	3	4	-1
2/22/24			0
2/26/24	5	2	3
2/27/24	3	1	2
2/28/24	3	2	1
2/29/24	7	0	7
3/4/24	7	0	7
3/5/24	6	0	6
3/6/24	6	3	3
3/7/24	2	1	1
3/11/24	5	2	3
3/12/24	3	1	2
3/13/24	5	1	4
3/14/24	2	1	1
3/18/24	3	1	2
3/19/24	10	0	10
3/20/24	1	0	1
3/21/24	6	0	6

Appendix H: Raw Data of Observation Notes

- 2/12/24 The student's mom reported that he was tired today. When he got out of the car he lay down in the grass. His mom carried him into the school. He participated about half of the time in the music time.
- 2/13/24 Came into school excited because we were decorating cookies. Participated in the action in all the songs. Engaged, but very little singing.
- 2/14/24 No singing today. The kids were too excited about their party.
- 2/15/24 Focus student played in the play area with child 1. At first child 1 didn't want to. But they ended up having a lot of fun together.
- 2/19/24 Focus student was non participatory in music time. Went and sat at a table and chose not to participate.
- 2/20/24 Good participation in singing/motions today.
- 2/21/24 We only had time for one song today. The focus child wanted to keep singing together, but we ran out of time.
- 2/26/24 Today we opened and expanded the play area. The focus child spent much of the morning playing together with other children. There were very few incidents. Once or twice, he was told to stop doing something and he responded appropriately. Once, however, a child was bothered because another child kept saying, "Teams". When the focus child realized that his caused a negative reaction in the other child, he kept repeating it.
- 2/27/24 The focus child got his hand stuck and was very calm asking for help even though he was scared. When the focus child got ready to have snack he went to join one table, but noticed that another child was sitting by himself. He looked at the other child and said, "I love you. You're my friend. I'll stay at the table with you."
- 2/29/24 The focus child helped a friend who was sitting beside him pick up beans that he spilled.
- 3/4/24 Today the focus child went immediately to play with playdough after line time instead of playing in the play area with the other students like he usually does. Later he spent a lot of time in imaginary play with another student. About 30 minutes.
- 3/5/24 When the focus child came into school today another student told me about how that focus child used to be mean but now, he's learned how to be a good friend. The focus student asked that child for a hug and they gave each other a nice hug. The two of them spent a lot of time playing together in the play area.
- 3/6/24
- 3/11/24 A student responded "No" to the focus student when he asked him to play playdough with him. The focus student watched sadly as the other student walked away, but just for a moment. There was no other negative reaction or outburst.
- 3/12/24 Today we had music at the end of the day instead of at the beginning as usual.

- 3/13/24 The focus child didn't get the rhythm instrument he wanted. The rest of the music time he just sat and watched without incident.
- 3/19/24 A student's water bottle leaked all over the floor and under all the backpacks. The focus student was the first one to volunteer to help clean it up.

Appendix I: Raw Data of Before and After Parental Surveys

How often does the subject show awareness of negative emotions expressed by other members of the family? (sadness, frustration, hurt, etc.)				
	Usually	Sometimes	Rarely	Never
Before		X		
After	X			

How common is it for the subject to express a desire to share something with someone else in the family?				
	Usually	Sometimes	Rarely	Never
Before			X	
After		X		

How often does the subject try to engage in cooperative play with other members of his family?						
	Daily	Several times a day	Several times a week	Weekly	Seldom	Not at all
Before			X			
After		X				

How often does the subject express outbursts of negative emotion?						
	Daily	Several times a day	Several times a week	Weekly	Seldom	Not at all
Before	X					
After		X				

How often does the subject express feelings of positivity? (singing, joyful playing, positive statements, peacefulness)						
	Daily	Several times a day	Several times a week	Weekly	Seldom	Not at all
Before	X					
After	X					

How often does the subject show cooperation when asked to do something?				
	Usually	Sometimes	Rarely	Never
Before			X	
After		X		

Appendix J: Raw Data of Survey for Social Behavior at Time of Pick up

	Did the subject listen and respond to you the first time you asked him/her to get into the car?				If the subject did not respond the first time you asked him/her to get into the car was it due to his/her interaction with, or a seeming desire to interact with his/her classmates?				
	Yes	No	N/A	I don't remember	Yes	No	N/A	I don't know	I don't remember
1/22/24	X						X		
1/23/24		X				X			
1/24/24	X						X		
1/25/24	X						X		
1/29/24	X						X		
1/30/24	X						X		
1/31/24		X			X				
2/1/24	X						X		
2/5/24	X						X		
2/6/24	X						X		
2/7/24	X						X		
2/8/24	X						X		
2/12/24		X			X				
2/13/24	X						X		
2/14/24	X						X		
2/15/24		X						X	
2/19/24		X				X			
2/20/24	X						X		
2/21/24		X			X				
2/22/24	X						X		
2/26/24	X						X		
27-Feb	X						X		
2/28/24									
2/29/24	X						X		
3/4/24		X			X				
3/5/24		X			X				
3/6/24		X			X				
3/7/24	X				X				
3/11/24		X					X		
3/12/24		X					X		
3/13/24		X			X				
3/14/24	X						X		
3/18/24		X			X				
3/19/24	X						X		
3/20/24	X						X		
3/21/24		X				X			

*Blue shading corresponds to a music week

	On the ride home did the subject seem:					On the ride home did the subject talk about classmates?				On the ride home did the subject make any comment that showed that he/she was aware of another person's feelings at school?	
	Happy	Content	Sad	Mad	Other	Yes	No	In a positive way?	In a negative way?	Yes	No
1/22/24		X				X		X	X	X	
1/23/24		X				X		X			X
1/24/24	X						X				X
1/25/24		X					X				X
1/29/24				X			X				X
1/30/24	X						X				X
1/31/24		X					X			X	
2/1/24	X					X		X			X
2/5/24	X					X		X			X
2/6/24		X					X				X
2/7/24		X				X		X			X
2/8/24	X					X		X			X
2/12/24	X						X				X
2/13/24		X					X				X
2/14/24	X					X		X			X
2/15/24		X					X				X
2/19/24		X				X		X			X
2/20/24	X					X		X			X
2/21/24		X					X				X
2/22/24		X					X				X
2/26/24	X					X		X			X
27-Feb	X					X		X			X
2/28/24											
2/29/24		X					X				X
3/4/24		X					X				X
3/5/24		X				X		X	X	X	
3/6/24	X					X		X			X
3/7/24	X					X		X			X
3/11/24	X						X				X
3/12/24	X						X				X
3/13/24		X					X				X
3/14/24		X					X				X
3/18/24		X				X					X
3/19/24		X				X	X	X	X	X	
3/20/24		X					X				X
3/21/24	X					X		X		X	