



Exploring Prosocial Performance and Gender Differences in Pre-school Children Through Music Activities

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Although gender difference in prosociality has been researched so far, only a very few studies examined the effect of musical methods on positive prosocial behavior. In this preliminary examination, we focused on finding the relation between music activities and prosocial behavior with respect to gender in pre-school children in line with Social Cognitive Learning Theory (SCLT). We observed sixteen pre-school children of 4–6 years, and two kids per student-teacher observer for sixteen sessions, each at a span of 45 min one session per week, and data were collected through situational tests and observational methods. Results show that music methods are positively related to mood stability, reciprocity, and interaction with peers. The findings are discussed in terms of spontaneous reciprocity and gender-specific responses to social behavior.

Keywords: pre-school children, prosocial behavior assessment system (PBAS), spontaneous response index (SRI), music activities, gender difference

INTRODUCTION

Music of different varieties and its association with enhancing communication are always intriguing. It may be due to multi-sensory involvement while playing or participating in any kind of music. Music can do magic on anybody's mind and emotions because it has many ingredients, such as rhythm, pattern, voice/vocal, instrumental, and associative imaginations, being in synchronization with all of these certainly taps interpersonal competencies in any. Music is a very flexible nature's way of communication that tunes emotions, soothes moods, and absolutely synchronize with individuals' perceptions. Recently, music scholars have started shifting their focus to understand its role in developing communication competence (CC). This is an ability of expression, interpersonal skills, attention, and action. Further in-depth, cognitive aspects of communication (CaC) can be referred to as responding spontaneously, perceiving and processing new information, spontaneous decision-making, and varied verbal and non-verbal expressions affecting external situations. Developing these skills from an early age would certainly benefit learners' communication behavior in their interactions with peers, parents, and teachers, which is further reflected in their social behavior. This crucial CC in early childhood education is mostly connected with the theory of mind (O'Toole et al., 2017) too, as most often, it is related to external beliefs, desires, and intentions of people around them. Thus, children's social behavior obviously depend on their cognitive ability and most social behavior theorists emphasize this (Green and Piel, 2009).

Many researchers (McCormick and Martinko, 2004) based on their observations found that children acquire social behavior by observational learning and behavior is self-regulated, sometimes

punishments and material rewards may affect their behavior largely. Further learning may not necessarily affect behavior, as imitation is only conditional (Green and Piel, 2009).

According to Masten et al. (2012) and Gomes and Livesey (2008), children with greater CC will exhibit greater peer acceptance and prosocial behavior, a combination of emotions, inhibition, interpersonal communication, and spontaneous responding. Goldstein et al. (2014) called this high order of cognitive skill the Effective Function (EF). This has been differentiated into many aspects, such as emotion and working memory and preparation. Further, it was predicted that music has the magical power of influencing emotions (Kirschner and Tomasello, 2009). The term “prosocial behavior” is broadly understood as kindness, understanding, empathy, tenderness, and compassion. This is in turn looking oneself in the shoes of the other. The one who is observing will be “moved by the other.” Hoffman (2001) observed interesting issues in the development of prosocial behavior in children. In the stagewise observation, Hoffman emphasized the conditions that affected the performance of prosocial acts. Hoffman observed that pre-school children's cognitive representation of the social world is characterized by self-other fusion and hence the development of compassion leads to deriving the emotional experience.

From the literature on social behavior and interactions, it is evident that children with high emotions, spontaneity in responding, and working memory show greater prosocial behavior as emotions play a vital role in social communications. Therefore, studies on prosocial behavior in children aged 2–5 years (Garner and Waajid, 2012; Kim et al., 2013; Di Norcia et al., 2015), suggest that emotions are directly proportional to interactions in children of this age. A study on children aged 4–6 years old (McQuade et al., 2013), reports greater cognitive skills to affect greatly on interaction with peers. In a study on 3–5 years old (Renouf et al., 2010), however suggest that the innate role of cognitive abilities in the form of emotional behavior may be differently processed by children depending on their ability to do so. A few other studies (Ostrov and Godleski, 2010) have suggested observational research on the development of prosocial behavioral patterns in early childhood boys and girls. In a study by Gur et al. (2012) girls exhibited higher goal-oriented cognitive abilities, on the other hand, Werner et al. (2006) observed that boys have higher intentions, beliefs, and desires that attributed to their mental status than girls whereas Yagmurlu's (2013) study was unclear about gender as a moderator across these mental statuses, especially in pre-school children.

MUSIC ACTIVITY AND SOCIAL COGNITIVE LEARNING THEORY

Music has many melodies based on its form, instrument, meter, rhyme, and rhythm. Culture, aesthetic, and communicative perspectives also affect rhyme and rhythm. When we speak about gender, many intersectional theories of it also may intervene in making music (Fornäs and Xinaris, 2013). We look at cognitive regulators based on Social Learning Theory (SLT) and social cognitive learning theory (SCLT) (Bandura, 1986).

Bandura argued that individuals learn both behaviors and cognitive strategies by observing the behavior of others, and these acquisitions can be learned without being directly reinforced (Green and Piel, 2009). Betz (2007) supported Bandura's basic assumptions of SCLT and pointed out that behavior is directed toward particular goals, behavior eventually becomes self-regulated and cognition plays a role in learning. Garner and Waajid (2012) emphasized that situation knowledge component of emotional knowledge was the active ingredient for both cognitive and social competence. However, different aspects of self-regulation were relevant for different outcomes: the attentional control element was important for cognitive competence, whereas the positive emotionality element was important for social competence and behavior problems. Hence, in the present study, we relate to measuring the gender-specific acquisition of new behavior in a regular musical class and spontaneous responses in the given situation.

Music and Prosocial Behavior

Hagen and Bryant (2003) proposed that singing and dancing in groups aim to establish a collective relationship to improve collective relationships and internal stability among pre-school children. Perhaps this may be the reason for many religious rituals in the world, which take place in groups and also for researchers to identify the mediating role of religion in developing prosocial acts (Sam and Gustavo, 2005) by group display and signal theories (Clayton, 2009). The foremost communication between an infant and a mother is also through lullabies (Falk, 2004), which greatly serve to soothe (Trehub, 2006) and communicate emotions (Fernald, 1989) between them mutually to understand each other. Another study by Huron (2001) suggests that music and dance are effective tools to establish communication between groups. Wiltermuth and Heath (2009) through their study on the US students found that synchronous singing with the same stimuli at an individual pace improved their performance in economic games. Music has been a positive motivational predictor along with social desirability and team success.

The Present Study

The focus of this study is on examining pre-school children's prosocial behavior in a musical class during sixteen musical activity sessions conducted as a special course to improve their language and communication ability while inculcating prosocial behavior through observational learning. There has been always gender segregation in the activities we do. However, children of this age are less prone to social gender differences and their spontaneous response to a given situation is more likely to be their natural tendency. Specifically, we pursued how children's understanding of communication, reciprocation of actions, emotion, and interpersonal skills will influence prosocial behavior in line with cognitive regulators in accordance with Social Cognitive Theory in particular to gender (Nabavi, 2012). Using a pre-designed observation form, we examined the associations between five key variables in the form and also twelve items spontaneous response scale. We also examined how children use their own discretion in a given situation

without any external influences. The spontaneous responses were recorded on the scale in the musical storytelling sessions for 16 weeks, as opposed to a trait-based measure of prosociality, to examine children's tendency to act prosocially, specifically in the situational context. We included external cognitive triggers to understand the association of colors and music rhythm, accepting that music has an indispensable role in developing prosocial behavioral skills (Wiltermuth and Heath, 2009). Based on the previous studies and the findings, the present research proposes specific hypotheses on the gender-specific association between music and prosocial behavior based on the SCLT, as shown in **Figure 1**.

The questions that this empirical study intends to explore are:

- (1) What are the mechanics to root prosociality in pre-school children?
- (2) Whether or not in specific situation compassion was more a subjective experience than emotion?
- (3) Whether or not there is a gender-specific association between music activities and prosociality?
- (4) Whether or not the pre-school children responded on their own or the actions are regulated by the conditions around them?

METHOD

Participants

In total, 16 children under the age 4–6 years (mean age = 4.75, standard deviation [SD] = 0.75) who were attending a school music appreciation course, early childhood through Music American English, had participated in this study. There were seven boys (age range = 4–6, mean age = 4.71) and nine girls (mean age = 4.66). All these participants were from Taiwan,

with no prior exposure to any foreign language, including English. All these participants came from educated families; all were attending pre-school regularly and belonged to the same geographical area in the middle part of Taiwan. These kids were learning the English language through a very well-established, research-based early childhood English through a Music Education program that was designed by integrating songs, music games, musical stories, and music for body and mind. The music referred to is the musical activity, such as line walks, welcome songs, roll call songs, singing activities, ballad games, music stories, music rhythms, and soothing and goodbye songs.

These classes ran once a week with a duration of 45 min along with their regular teachers and students-teachers as observers for a total duration of 16 weeks. There was no fee to participate in this program. Learners could participate in a specially designed course. This study was carried out under the project, "FigureNotes Pedagogy" as a reflective praxis for pre-school children with and without autistic spectrum disorder. The project materials and methods, literature, and others had also been taught for research graduate students under 3-credit course "Monographic Study of Music Therapy for Young Children" (no. 7377) at Chaoyang University of Technology, Taichung, Taiwan following all ethical requirements. For this, we had taken consent from the parents/guardians of children (4–6 years). The ethical board of the university has approved the study (ethical approval forms are available).

Measures

The measure of prosocial behavior and spontaneous responses to musical activities were all appropriate (Clayton, 2009). Five measures, mood stability, reciprocation of actions, physical movements, interactions, and musical activities,

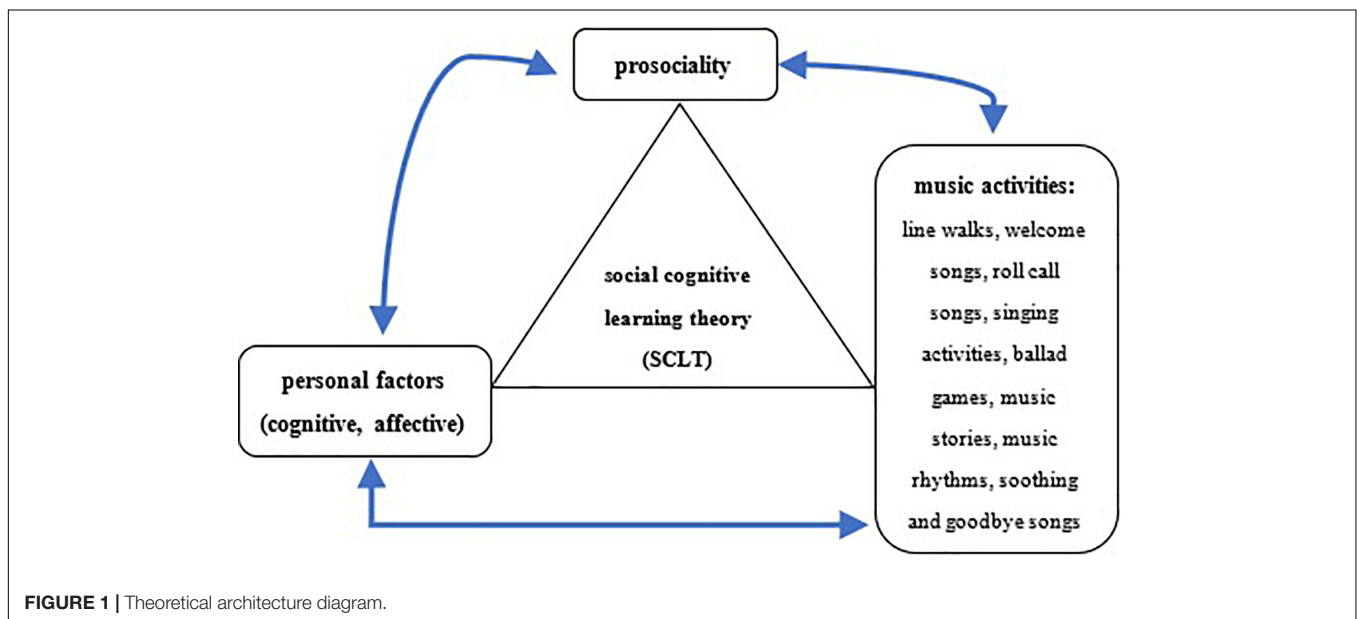


FIGURE 1 | Theoretical architecture diagram.

were decided to examine the children's musical behavior in everyday emotions, communication, musical action, interpersonal, tactile, and mood stability in a musical class situation.

Based on Holistic Music Education and Young Children (HMEAYC; Lee and Lin, 2020), children's musical activities, peer acceptance, and interaction with parents were gauged by the index developed by the researcher which has statistical reliability and internal reliability to assess whether boys or girls exhibit higher prosocial behavior within the musical activities designed. The musical activities include musical storytelling and various situational musical songs designed (Lee and Ho, 2018). It was based on the responses recorded by student-teacher observers. Each one has to observe two kids at a time. The students-teachers have to rate on a scale from 1 almost never to 5 always. Scores for all five musical activities were summarized resulting in a test for normality and other parametric tests to measure the internal consistency of the data. The following instruments are used to collect the data.

Prosocial Behavior Assessment System—As an Observational Report

As this study was set in a typical music class to devise to evaluate children's cognitive and social learning behavior by designing a set of observation forms by student-teacher by rating the children's situational responses according to the story designed. This scale was designed by authors to assess the CC of the kids along with their self-motivation to share and care within a given context (Eisenberg et al., 2007). Five parameters, i.e., mood stability (for low and high music), reciprocations (for the ongoing situational actions), physical movements (responding as per the dialogues/instructions), interaction (with peers and teachers), and musical actions (as per the rhyme and rhythm of the music).

Spontaneous Response Index: (As a Situational Test)

There are theories that largely focus on the effects of social, parental, and behavioral in gender different attitudes. However, it is very important to consider cognitive differences between boys and girls that help to review the development of prosocial behavior. Hence, the spontaneous response index (SRI) form focuses on cognitive factors, which are external triggers and internal regulators (Rose and Rudolph, 2006; Nabavi, 2012), e.g., (1) responding spontaneously, (2) processing of old or new information, (3) spontaneous decision-making, and (4) experiences from external situations.

To measure spontaneous responses, 12 items were designed into two groups, i.e., (1) internal cognitive regulators and (2) external cognitive triggers, every six items into one group. These responses were noted by using a musical storytelling big book with pictures as a teaching aid. The book had both movable and non-movable pictures. It was designed as a more colorful and self-regulatory teaching tool. Using this and music that synchronize according to the story, the teacher injected the musical story into the children. On the other

hand, the student-teacher observers recorded the responses on the SRI scale and marked on the prosocial behavior assessment system (PBAS) observation form. The children's spontaneous responses were recorded by using the twelve statements that helped them to analyze the mechanics that helped to associate music activities and prosocial behavior. Quantitative data were measured using descriptive and Mann-Whitney tests to know the statistical significance to find gender-specific associations.

Study Design

It was a situational test, set in a typical musical class. The classes took place in sixteen consecutive sessions. In each class, children were exposed to musical tunes, colors, songs, and storytelling journals. These all were integrated with many see, touch, feel, and sense materials, such as soothing balls, velvet pads for walking on, and pictures made with different materials. The experimental conditions focused to devise to identifying the intention behind a prosocial action of children. An observation form was used to record the emotions/moods, communication/stability of reciprocation of actions, interpersonal skills, musical ability, and tactile that were taught in 45 min in a week of musical sessions in a specific experimental setup. Alongside an SRI was marked to examine the actions that were conditioned around. This would also help to understand the relationship between situational compassion and emotion.

Statistical Methods

Normality and Non-parametric Tests for the Prosocial Behavior Assessment System Observation Forms

To test the data at various levels and find out the statistical significance to proceed for further analysis, first, a normality test was carried out using Shapiro and Kolmogorov as shown below, and it revealed that all the variables were not normally distributed except the kid interaction. In mood stability, reciprocations, physical movements, and musical activities, all p -values were less than 0.05 except for the kid's interaction ($p = 0.094$), hence we proceeded with non-parametric tests using Spearman rank correlation and the Mann-Whitney U test.

Further, there were only 16 children in this study, which was a small sample, and it was more appropriate to analyze data with the non-parametric statistics method, which was more robust, and the calculation process was relatively simple. According to the results of the Mann-Whitney U test in **Table 1**, there is no significant difference (all p -values not less than 0.05) between genders in the five dimensions of the PBAS observation table, which indicates that boys and girls behave the same in all five dimensions. Although there was no significant difference in inference statistics, we could still find how boys and girls differed from the mean score. Girls scored slightly higher than boys in reciprocating and interaction, and boys scored slightly higher than girls in the remaining three items. This study proposes that what is worth paying attention to is the emotional stability of boys, which can be performed well through musical activities. Physical movements for the musical

activities include the rhythm, high-low tones, the musical aids, and the lyrics used for both songs and storytelling. In the musical activities used for this study, boys' performance is higher when compared to the girls (Ho, 2003). This shows how music activities have a positive effect on their mood stability, interaction with peers, teachers, and people around, and their physical movements according to the rhythm (Martin and Fabes, 2001; Hallam, 2010).

Results From the Spontaneous Response Index Scale

Below is a twelve-item scale, named as SRI. Each of these items has been inconsistent with the actions done by the children. This is a self-compiled, semi-structured observation scale for the students-teachers and observers. **Tables 2, 3** show two pieces of information. One is the Mann-Whitney U test result, on the SRI scale, there is no significant difference between boys and girls in the 12 indicators. The other is a descriptive statistical analysis for boys, girls, and the whole population. The responses for all variables are not deviated from the mean except for spontaneous imagination ($M = 4.06$ and $SD = 1.12$) it is on an average little over 1 point away from the mean. In addition, the external cognitive trigger of the association between sounds and colors ($M = 2.69$; $SD = 1.08$) is 1 point away from the mean. Almost all SD values are exactly within the mean value and did not deviate from the mean at all.

Through **Tables 2, 3**, we can understand that the boys' responses to internal cognitive regulators are higher ($M_{\text{boy}} = 3.79$, $SD_{\text{boy}} = 0.71$; $M_{\text{girl}} = 3.48$, $SD_{\text{girl}} = 0.81$) and girls' responses to external cognitive triggers are higher ($M_{\text{girl}} = 3.06$, $SD_{\text{girl}} = 0.68$; $M_{\text{boy}} = 2.81$, $SD_{\text{boy}} = 0.62$). For all young children, the spontaneous imagination score ($M = 4.06$; $SD = 1.12$) is the highest in the internal cognitive regulators, and association with musical activities scored highest ($M = 3.44$; $SD = 0.51$) in the external cognitive triggers. Nabavi (2012) identified five internal cognitive factors that influence social-cognitive behavior. The boys exhibited higher scores in spontaneous reciprocity, which is the key factor that influences prosocial behavior (Gomes and Livesey, 2008). The girls exhibited higher scores in associating actions, color, images, memory, and imagination with musical activities in which they participated. These external cognitive triggers help to understand their multi-sensory involvement and it also allows us to understand how well a child could relate to stabilize the emotions to develop strong reciprocity and tend to cooperate naturally. This shows interesting results that external cognitive triggers may possibly not affect the internal cognitive regulators in this group of pre-school children.

DISCUSSION

The present study investigated the moderation of music in the association between gender and prosocial behavior using PBAS and SRI scales. We found both internal and external cognitive components of prosociality are positively

associated with the self-reported prosocial behavior and boys exhibited higher prosociality than girls. Although previous studies on gender and prosocial behavior are based on socio-cognitive measures that girls have higher tendencies on interpersonal empathy, emotion, and social behavior (Rudolph and Conley, 2005). The finding that music (Hallam, 2010; Zentner and Eerola, 2010; Garner and Waajid, 2012) is associated with prosocial behavior among pre-school children supports previous studies suggesting that music is a key motivating factor for inculcating prosocial behavior (Hallam, 2010). Interestingly, association between gender and music, gender and prosociality is moderately correlated. The finding shows that pre-school children can be conditioned within a situation to develop altruistic behavior (Olson and Spelke, 2008). We also observed that spontaneity and non-voluntary expressiveness are positively associated with altruistic tendencies. This observation and the scales developed fit with previous studies suggesting.

What mechanics would help root prosociality in pre-school children? We considered mood stability, reciprocations, physical movements, interaction, musical activities, stories, games, and an instrumental musical-learning environment that elicits non-voluntary behavior in any child. Children's interaction within their learning environment creates a social context for their sociability (Vygotsky, 1978). Piaget emphasizes peer interaction as a facilitator, which can modify a variety of prosocial activities (Piaget, 1932). In particular, Piaget highlighted the cooperative learning activities. Musical activities create more realistic situations and stabilize emotions to develop strong reciprocity. In such an environment, children tend to cooperate with each other (Wiltermuth and Heath, 2009). In this situational method, the children have to listen, observe, act, and reciprocate to participate by singing, dancing, and acting with the musical activities stressed, and student-teacher observers help the children who face difficulty in doing these, repeatedly. The results where the boys have exhibited higher mood stability and so their responses in the given situation are subjective and not emotional but it is a more spontaneous compassion. These non-voluntary responses to music nurture cooperation in this context (Solomon et al., 1988). This enables children to build strong bondage with their peers and teachers around and their acceptance of giving and receiving. The external cognitive triggers are to understand to what extent a child could associate with the external stimuli. Though it is found that there is a gender-specific significance in prosociality, for each of the variables chosen, there are mixed results. The statistical scores for mood stability are significant for boys, girls have high physical movements (verbal and non-verbal communication) and interaction is higher in boys. Girls scored high in associating with the external stimuli, though the boys' scores are a little less when compared with the girls in associating with the external triggers, their SD values are exactly within the mean, and their scores are high in internal cognitive regulators. It shows through the situations are conditioned it will not affect the internal tendencies toward a situation in pre-school children. Musical storytelling, songs, and activities instructed to this group of children are a social context to have group synchrony (Kirschner and Tomasello, 2009) that facilitates coordination

TABLE 1 | Mann–Whitney U test statistics and descriptive statistical analysis of prosocial behavior assessment system (PBAS).

		Mood stability	Reciprocating	Physical movements	Interaction	Musical actions
Mann–Whitney U		22.00	28.50	21.00	30.50	17.00
<i>p</i> -value		0.351	0.758	0.299	0.918	0.142
Boy(<i>N</i> = 7)	Mean	3.86	2.71	3.57	3.29	3.71
	SD	1.46	0.76	0.79	1.80	1.25
Girl(<i>N</i> = 9)	Mean	3.56	2.78	2.89	3.33	2.67
	SD	0.73	1.56	1.36	1.00	1.41

TABLE 2 | Mann–Whitney U test statistics and descriptive statistical analysis of SRI scale (internal cognitive regulators).

		Conscious imagination	Spontaneous imagination	Spontaneous curiosity	Spontaneous visualization of actions	Spontaneous thinking and association	Conscious recalling	Mean
Mann–Whitney U		23.000	28.500	28.500	22.000	28.000	17.000	
<i>p</i> -value		0.408	0.758	0.758	0.351	0.758	0.142	
Boy(<i>N</i> = 7)	Mean	3.71	4.14	3.86	3.86	3.43	3.71	3.79
	SD	0.76	1.22	0.38	0.38	0.54	0.95	0.71
Girl(<i>N</i> = 9)	Mean	3.33	4.00	3.78	3.56	3.33	2.89	3.48
	SD	0.87	1.12	0.67	0.53	0.87	0.78	0.81
Total(<i>N</i> = 16)	Mean	3.50	4.06	3.81	3.69	3.38	3.25	3.62
	SD	0.82	1.12	0.54	0.48	0.72	0.93	0.77

TABLE 3 | Mann–Whitney U test statistics and descriptive statistical analysis of SRI scale (external cognitive triggers).

		Associating Bodily Movement	Association of sounds and colors	Associating a series of actions	Associating sounds and visual images	Longterm memory and imagination	Association to Musical activities	Mean
Mann–Whitney U		23.500	29.000	28.000	23.000	25.500	23.000	
<i>p</i> -value		0.41	0.84	0.76	0.41	0.54	0.41	
Boy(<i>N</i> = 7)	Mean	3.29	2.57	3.00	2.57	2.71	2.71	2.81
	SD	0.49	1.27	0.00	0.54	0.95	0.49	0.62
Girl(<i>N</i> = 9)	Mean	3.56	2.78	3.11	2.89	3.00	3.00	3.06
	SD	0.53	0.97	0.60	0.60	0.87	0.50	0.68
Total(<i>N</i> = 16)	Mean	2.88	2.69	3.06	2.75	2.88	3.44	2.95
	SD	0.50	1.08	0.44	0.58	0.89	0.51	0.58

between observers and children. All their physical movements and music are synchronous, which in turn instills positive social behavioral outcomes (Overy, 2012; Leclère et al., 2014).

CONCLUSION

The results were generalized to studies on peers in pre-school children. The activities are designed to encourage dancing, singing, and acting in sync with the rhythm to increase motor association and wellbeing in children. The multi-sensory nature of music can be an incredible tool to train the coordination of emotions and behavior among children (Lagattuta and Thompson, 2007; Cirelli et al., 2014; Judd and Pooley, 2014). This kind of environment, over a period of time, would increase connectedness with others and make them feel more inclusive.

Prosocial behavior is an independent voluntary positive consequence to others or situations around. Though the biological differences that affect our behavior according to

SLT prosociality can be learned by observation and one can match themselves with the social standards around by self-modeling. Inducing positive social standards through music is positively related to prosocial behavior in pre-school children. In early childhood, as children learn more by observation, for inculcating prosociality music is an irreplaceable tool. This study has a limitation with respect to the sample size as we have got mixed results in associating gender and prosociality. The girls have shown higher scores when associated with external cognitive triggers whereas boys exhibited higher mood stability and situational responses. Musical genres and different situations that affect prosociality would be studied in the future.

RESEARCH LIMITATION

There is an ongoing debate on how multi-sensory development in children can be studied more specifically to gender with musical interventions. The way it would benefit the long-term prosocial behavior in both boys and girls? There is very limited

research into pedagogical applications of associating different activities with learning materials other than musical instruments. Hence, this study is an attempt to look at covering some research into “internal and external cognitive components” that influence prosocial behavior, which is gender-specific and is beneficial in emotional stability in students. The external cognitive triggers lead to a conscious or unconscious response to external stimuli, e.g., music, color, audio, and imagery can possibly be associated with mood stability and we tried looking into availing these benefits of these stimuli, which is the focus of current research. We intend to study the smaller group, by integrating various domains, which could encourage the development of a model in future research.

IMPLICATION

This study explored the prosocial behavior and gender differences of young children through music activities, and the music activities used in this study were the teaching methods created by the authors. This is our preliminary study, we initially evaluated these parameters, and the statistical interpretations are based on the responses and are done in line with the previous research studies into gender-specific prosociality. This will be a paradigm shift in multidisciplinary research that addresses current pedagogical issues on how it can be applied to enhance

prosocial capabilities for children in their early childhood. It is suggested that researchers who are interested in music teaching in the future can consider integrating music activities into English pedagogy, not only in the part of early childhood education but also in children's music curriculum activities, and can also explore learners' prosocial behavior through music teaching activities.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Shu-Hui-Chung, Chaoyang University of Technology. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors have equally contributed to the research viz., in collecting data, design, methods, and results.

REFERENCES

- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Upper Saddle River, NJ: Prentice Hall.
- Betz, N. E. (2007). Career self-efficacy: exemplary recent research and emerging directions. *J. Career Assess.* 15, 403–422. doi: 10.1177/1069072707305759
- Cirelli, L. K., Einarson, K. M., and Trainor, L. J. (2014). Interpersonal synchrony increases prosocial behavior in infants. *Dev. Sci.* 17, 1003–1011. doi: 10.1111/desc.12193
- Clayton, M. (2009). “The social and personal functions of music in cross-cultural perspective,” in *The Oxford Handbook of Music Psychology*, eds S. Hallam, I. Cross, and M. Thaut (Oxford: Oxford University Press), doi: 10.1093/oxfordhb/9780199298457.013.0004
- Di Norcia, A., Pecora, G., Bombi, A. S., Baumgartner, E., and Laghi, F. (2015). Hot and cool inhibitory control in Italian toddlers: associations with social competence and behavioral problems. *J. Child Fam. Stud.* 24, 909–914. doi: 10.1007/s10826-014-9901-z
- Eisenberg, N., Fabes, R. A., and Spinrad, T. L. (2007). “Prosocial development,” in *Social, Emotional, and Personality Development*, ed. N. Eisenberg (Hoboken, NJ: Wiley). doi: 10.1002/9780470147658.chpsy0311
- Falk, D. (2004). Prelinguistic evolution in early hominins: Whence motherese? *Behav. Brain Sci.* 27, 491–503. doi: 10.1017/S0140525X04000111
- Fernald, A. (1989). Intonation and communicative intent in mothers' speech to infants: Is the melody the message? *Child Dev.* 60, 1497–1510. doi: 10.2307/1130938
- Fornäs, J., and Xinaris, C. (2013). Mediated identity formation: current trends in research and society. *J. Eur. Instit. Commun. Cult.* 20, 11–25. doi: 10.1080/13183222.2013.11009112
- Garner, P. W., and Waajid, B. (2012). Emotion knowledge and self-regulation as predictors of preschoolers' cognitive ability, classroom behavior, and social competence. *J. Psychoeduc. Assess.* 30, 330–343. doi: 10.1177/0734282912449441
- Goldstein, S., Naglieri, J. A., Princtopta, D., and Otero, T. M. (2014). “Introduction: A history of executive functioning as a theoretical and clinical construct,” in *Handbook of Executive Functioning*, eds S. Goldstein and J. A. Naglieri (New York, NY: Springer), 3–13. doi: 10.3389/fpsy.2020.00712
- Gomes, L., and Livesey, D. (2008). Exploring the link between impulsivity and peer relations in 5- and 6-year-old children. *Child Care Health Dev.* 34, 763–770. doi: 10.1111/j.1365-2214.2008.00878.x
- Green, M., and Piel, J. A. (2009). *Theories of Human Development: A Comparative Approach*, second Edn. Hoboken, NJ: Prentice-Hall, Inc.
- Gur, R. C., Richard, J., Calkins, M. E., Chiavacci, R., Hansen, J. A., Bilker, W. B., et al. (2012). Age group and sex differences in performance on a computerized neurocognitive battery in children age 8–21. *Neuropsychology* 26, 251–265. doi: 10.1037/a0026712
- Hagen, E. H., and Bryant, G. A. (2003). Music and dance as a coalition signaling system. *Hum. Nat.* 14, 21–51. doi: 10.1007/s12110-003-1015-z
- Hallam, S. (2010). The power of music: its impact on the intellectual, social and personal development of children and young people. *Int. J. Music Educ.* 28, 269–289. doi: 10.1177/0255761410370658
- Ho, W. (2003). Gender differences in instrumental learning, preferences for musical activities and musical genres: a comparative study on hong kong, shanghai and taipei. *Res. Stud. Music Educ.* 20, 60–76. doi: 10.1177/1321103X030200010401
- Hoffman, M. L. (2001). “Toward a comprehensive empathy-based theory of prosocial moral development,” in *Constructive & Destructive Behavior: Implications for Family, School, & Society*, eds A. C. Bohart and D. J. Stipek (Washington, DC: American Psychological Association), 61–86. doi: 10.1037/10433-003
- Huron, D. (2001). Is music an evolutionary adaptation? *Ann. N.Y. Acad. Sci.* 930, 43–61. doi: 10.1111/j.1749-6632.2001.tb05724.x
- Judd, M., and Pooley, J. A. (2014). The psychological benefits of participating in group singing for members of the general public. *Psychol. Music* 42, 269–283. doi: 10.1177/0305735612471237
- Kim, S., Nordling, J. K., Yoon, J. E., Boldt, L. J., and Kochanska, G. (2013). Effortful control in “hot” and “cool” tasks differentially predicts children's behavior problems and academic performance. *J. Abnormal Child Psychol.* 41, 43–56. doi: 10.1007/s10802-012-9661-4

- Kirschner, S., and Tomasello, M. (2009). Joint drumming: social context facilitates synchronization in preschool children. *J. Exp. Child Psychol.* 102, 299–314. doi: 10.1016/j.jecp.2008.07.005
- Lagattuta, K. H., and Thompson, R. A. (2007). "The development of self-conscious emotions: Cognitive processes and social influences," in *The Self-Conscious Emotions: Theory and Research*, eds J. L. Tracy, R. W. Robins, and J. P. Tangney (New York, NY: Guilford), 91–113. doi: 10.1177/0956797613475633
- Leclère, C., Viaux, S., Avril, M., Achard, C., Chetouani, M., Missonnier, S., et al. (2014). Why synchrony matters during mother-child interactions: a systematic review. *PLoS One* 9:e113571. doi: 10.1371/journal.pone.0113571
- Lee, L., and Ho, H. J. (2018). Exploring young children's communication development through the soundbeam trigger modes in the 'holistic music educational approach for young children,' Programme. *Malays. J. Music* 7, 1–19. doi: 10.37134/mjm.vol7.1.2018
- Lee, L., and Lin, H. F. (2020). Music educational therapy and the figurenotes music pedagogical approach for young children with special needs. *Univ. J. Educ. Res.* 8, 2483–2492. doi: 10.13189/ujer.2020.080632
- Martin, C. L., and Fabes, R. A. (2001). The stability and consequences of young children's same-sex peer interactions. *Dev. Psychol.* 37, 431–446. doi: 10.1037/0012-1649.37.3.431
- Masten, A. S., Herbers, J. E., Desjardins, C. D., Cutuli, J. J., McCormick, C. M., Sapienza, J. K., et al. (2012). Executive function skills and school success in young children experiencing homelessness. *Educ. Res.* 41, 375–384. doi: 10.3102/0013189X12459883
- Mccormick, M. J., and Martinko, M. J. (2004). Identifying leader social cognitions: integrating the causal reasoning perspective into social cognitive theory. *J. Leadersh. Organ. Stud.* 10, 2–11. doi: 10.1177/107179190401000401
- McQuade, J. D., Murray-Close, D., Shoulberg, E. K., and Hoza, B. (2013). Working memory and social functioning in children. *J. Exp. Child Psychol.* 115, 422–435. doi: 10.1016/j.jecp.2013.03.002
- Nabavi, R. T. (2012). Bandura's social learning theory & social cognitive learning theory. *J. Pers. Soc. Psychol.* 1:589.
- Olson, K. R., and Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition* 108, 222–231. doi: 10.1016/j.cognition.2007.12.003
- Ostrov, J. M., and Godleski, S. A. (2010). Toward an integrated gender-linked model of aggression subtypes in early and middle childhood. *Psychol. Rev.* 117, 233–242. doi: 10.1037/a0018070
- O'Toole, S., Monk, C. P., and Tsermentseli, S. (2017). Executive function and theory of mind as predictors of aggressive and prosocial behavior and peer acceptance in early childhood. *Soc. Dev.* 26, 907–920. doi: 10.1111/sode.12231
- Overy, K. (2012). Making music in a group: synchronization and shared experience. *Ann. N.Y. Acad. Sci.* 1252, 65–68. doi: 10.1111/j.1749-6632.2012.06530.x
- Piaget, J. (1932). *Moral Judgment of the Child*. London: Routledge.
- Renouf, A., Brendgen, M., Parent, S., Vitaro, F., Zelazo, P. D., Boivin, M., et al. (2010). Relations between theory of mind and indirect and physical aggression in kindergarten: evidence of the moderating role of prosocial behaviors. *Soc. Dev.* 19, 535–555. doi: 10.1111/j.1467-9507.2009.00552.x
- Rose, A. J., and Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: potential trade-offs for the emotional and behavioral development of girls and boys. *Psychol. Bull.* 132, 98–131. doi: 10.1037/0033-2909.132.1.98
- Rudolph, K. D., and Conley, C. S. (2005). The socioemotional costs and benefits of social-evaluative concerns: Do girls care too much? *J. Pers.* 73, 115–138. doi: 10.1111/j.1467-6494.2004.00306.x
- Sam, A. H., and Gustavo, C. (2005). Religiosity and prosocial behaviors in adolescence: the mediating role of prosocial values. *J. Moral Educ.* 34, 231–249. doi: 10.1080/03057240500127210
- Solomon, D., Watson, M. S., Delucchi, K. L., Schaps, E., and Battistich, V. (1988). Enhancing children's prosocial behavior in the classroom. *Am. Educ. Res. J.* 25, 527–554. doi: 10.3102/00028312025004527
- Trehub, S. E. (2006). Musical predispositions in infancy. *Ann. N.Y. Acad. Sci.* 930, 1–16. doi: 10.1111/j.1749-6632.2001.tb05721.x
- Vygotsky, L. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge MA: Harvard University Press.
- Werner, R. S., Cassidy, K. W., and Juliano, M. (2006). The role of social-cognitive abilities in preschoolers' aggressive behaviour. *Br. J. Dev. Psychol.* 24, 775–799. doi: 10.1348/026151005X78799
- Wiltermuth, S. S., and Heath, C. (2009). Synchrony and cooperation. *Psychol. Sci.* 20, 1–5. doi: 10.1111/j.1467-9280.2008.02253.x
- Yagmurlu, B. (2013). Relations among sociocognitive abilities and prosocial behavior. *J. Child Fam. Stud.* 23, 591–603. doi: 10.1007/s10826-013-9726-1
- Zentner, M., and Erola, T. (2010). Rhythmic engagement with music in infancy. *Proc. Natl. Acad. Sci. U.S.A.* 107, 5768–5773. doi: 10.1073/pnas.100012110

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