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# Correlational Study on Musical Literacy Training for Preschool Children and Music Aptitude Development

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**Abstract**

Music literacy, a foundational discipline for cultivating musical abilities, aims to foster comprehensive musical skills in young children. This study employs scientifically validated methods to assess the musical aptitude of preschoolers, offering insights into their current musical capabilities. Conducted in a kindergarten in City X, China, the research investigates the music aptitude of 4-6-year-old children and explores patterns in music literacy development. Findings from tests conducted on 150 preschoolers reveal: 1. No significant disparity in music aptitude among preschoolers without prior professional music literacy training; 2. Markedly superior musical aptitude among children who have undergone music literacy training. Based on these results, the study recommends the timely introduction of music literacy education during the critical developmental phase of 4-6 years, which can substantially enhance children's musical abilities.

**Keywords:** Music Education, Early Childhood Education, Music Literacy Training, Music Aptitude, Preschoolers

## Introduction

In 2015, the General Office of the State Council of China issued the "Opinions on Comprehensive Strengthening and Improving School Aesthetic Education." In 2020, the General Office of the Central Committee of the Communist Party of China and the State Council jointly released the "Opinions on Comprehensive Strengthening and Improving Aesthetic Education in Schools in the New Era" (Lv, 2022). The successive issuance of these two documents signifies an unprecedented level of national attention to school aesthetic education. In the field of early childhood education, the "Regulations on Kindergarten Work" of 2016 emphasize the comprehensive development of preschoolers in morality, intelligence, physical health, aesthetics, and labor skills. It particularly highlights the cultivation of preschoolers' abilities to appreciate beauty and exhibit moral virtues, integrating these aspects into the content and objectives of artistic educational activities (Lv, 2022).

Music is the most important subject in the field of arts, as it can be integrated into various aspects of kindergarten teaching activities. Moreover, the early childhood period is the optimal time for cultivating musical abilities. Children exhibit remarkable creativity in art, experiencing and creating music in their own unique ways (Cheng, 2021).

Renowned music education scholar Gordon has extensively studied music learning during early childhood. Through years of testing and surveys, he found that the period before the age of 9 is crucial for music learning, as musical abilities are largely formed after this age (Gordon, 2013). Thus, the preschool period is critical for music learning, as the unique nature of musical abilities makes it difficult to achieve significant development if this key period is missed. No other art form provides children with such vast and unrestricted imaginative space as music. Quality and appropriate music education is the best way to cultivate children's imagination and attention allocation abilities (Luo & Huang, 1995).

This study aims to explore the possible correlation between music literacy training and musical abilities in children aged 4-6. In-depth research into this relationship not only helps in understanding the musical abilities of children entering the crucial period of music development at ages 4-6, identifying the strengths and weaknesses of each child in musical development, and making educational strategies more targeted for teachers, but also sheds light on the correlation between music literacy training and musical ability development. This, in turn, guides people to recognize the importance of music literacy training in practice.

**Literature Review**

In "The New Grove Dictionary of Musical Instruments," music literacy is defined as the level of music skills and understanding attained by an individual at any given time. It is the product of the combination of music ability tendencies and music learning (Deans & Sadie, 1984). Boyle, J.D., considers music literacy to refer to an individual's musical potential, particularly in developing musical skills (Colwell & Davidson, 1996). Soviet scholar Jeplov refers to music literacy as "musical aptitude" and defines it as "the qualitative unique combination of abilities upon which the possibility of engaging in music activities depends." This primarily includes tonal sensitivity, auditory performance abilities, and musical rhythm sense (Sun, 1990).

In 1981, Schott Dyson and Gabriel summarized the main characteristics of music development at various ages. The development of music abilities in preschool children is manifested as follows: at ages 3-4, they can perceive melodic contours and cultivate absolute pitch; at ages 4-5, they can recognize pitch and pitch range, and repeat simple rhythms; at ages 5-6, they can produce loud and soft sounds, and recognize identical parts from several relatively simple melodies or rhythms (Luo & Huang, 1995). Gordon believes that the music literacy education received in the first five years of a child's life lays a solid foundation for their subsequent education stages. Once the crucial opportunity for forming this educational foundation is missed, it cannot be added or corrected later. Gordon views music aptitude as the key factor in music learning, which includes mastery of elements such as rhythm, pitch, and auditory imagery (Gordon, 1986). In other words, from birth to age five is the crucial period for the development of infant and toddler music abilities.

Although there is not yet a fully consistent view in the academic community regarding the definitions of music literacy and music abilities, it must be acknowledged that, despite the complexity of the nature of music literacy and music abilities, scholars do exhibit some degree of consensus in defining the essence of music literacy and music abilities. For example, both Westendorp and Jeplov primarily focus on individuals' ability to distinguish the basic properties of sound, including tonal sensitivity, auditory imagery, and rhythm sense (Li, 2020).

Additionally, Gordon, when discussing children's music abilities, also emphasizes the concept of "audiation," considering it as the foundation for developing musicality (Gordon, 1986). However, it's important to note that "audiation" is not entirely synonymous with auditory perception; it mainly involves individuals' understanding and thought processes about music, enabling them to consciously predict patterns in unfamiliar music and sounds. As Jiang Cunmei pointed out, many scholars' music aptitude tests tend to focus heavily on assessing individuals' auditory perception abilities regarding music Jiang (2005), such as their ability to discern basic musical elements like rhythm, timbre, and pitch. Therefore, fundamentally, music abilities are more about the auditory perception abilities of musical materials—it is not only a fundamental component of music abilities but also the foundation and starting point for other aspects of musical abilities (Cheng, 2021).

In addition, Gordon also believes that the music abilities children acquire before the age of 9 are actually the result of innate potential and early musical environments, constituting a "developable music ability." Lachido's definition of music ability aligns with Gordon's perspective, stating that music ability refers to the sum of the qualities acquired by individuals under the combined influence of musical potential, external environments, and formal music education (Greer et al., 1988).

In recent years, there has been an increasing amount of research on early childhood music literacy. Lv Yin (2022) conducted a survey on the musical abilities of 6-year-old children in eight kindergartens in Guangzhou, China. Gao Pan (2018) investigated the development of musical rhythm abilities in preschool children who had not received specialized music training in ten ordinary kindergartens in Ningbo, China. Building upon these studies, this research expands the age range to include children aged 4-6 and broadens the scope of measurement to encompass various aspects of music literacy, including pitch and rhythm. Drawing primarily from Gordon's PMMA test and his music theory, this study defines early childhood music literacy as the ability to perceive and demonstrate sensitivity to pitch and rhythm.

## Methods

The subjects of this study were 150 preschool children randomly selected from a kindergarten in City X, China. Through preliminary investigations, it was found that only 50 of them had received music literacy training. For ease of data analysis and statistical purposes, the researchers divided them into three groups, each with an average of 50 individuals. Groups A and B consisted of preschool children who had not received specialized music literacy training, while Group C comprised preschool children who had received such training.

The primary objective of this study was to explore the developmental characteristics of music literacy training and music abilities in 4-6-year-old children. By initially understanding the development of music abilities in preschoolers, the study aimed to further analyze the correlation between music literacy training and music abilities in these children. Statistical analysis of the test results was conducted using SPSS. The research aimed to understand the current status of music abilities in preschool children and further analyze the relationship between the strength of music abilities and music literacy learning. The earliest music aptitude tests can be traced back to 1988, when German scholar C. Stumpf developed a test that involved students listening to piano notes and judging the pitch and harmony of consecutive notes to assess their music aptitude (Xu, 2014). In 1919, Westendorp published the first standardized music aptitude test, which mainly focused on six elemental abilities. This test assessed individual elemental abilities rather than overall musical ability (Bentley, 1966). In 1939, Wing's music intelligence test, which included seven items, was widely

recognized. This test, which emphasized musical sensitivity, was inherently musical in nature (Jiang, 2005). Bentley introduced the Music Aptitude Test in 1966, which primarily assessed pitch, rhythm memory, and other elements across four tests. The test was administered to individuals aged 7 or 8 to adults and lasted for 20 minutes (Jiang, 2005).

Notably, in 1965, Gordon developed the standardized Musical Aptitude Profile (Gordon, 1976). It was a comprehensive test that integrated elemental and overall theories. The test consisted of three parts, with musical examples performed by professional violinists or cellists twice. Participants were then asked whether the two performances were the same or which one exhibited more musicality. This test was both musical and capable of assessing the basic elements of musical talent. Moreover, its composite score had a high accuracy in predicting instrumental performance scores, earning it widespread appreciation. Gordon subsequently developed several tests for different age groups, ranging from children to adults (Gordon, 1986). These included "Audie" for children aged 3-4, Primary Measures of Music Audiation (PMMA) for kindergarten to third-grade students, Intermediate Measures of Music Audiation (IMMA) for first to sixth-grade students, and Advanced Measures of Music Audiation (AMMA) for fifth-grade students to adults.

Edwin Gordon's Primary Measures of Music Aptitude (PMMA) scale, developed in 1989, is designed for kindergarten to third-grade students to assess their developable music abilities. The scale comprises two aspects: Tonal and Rhythm. The test items, both for practice and standard questions, are pre-recorded on a tape and played during the test. The scale includes 7 practice questions (4 for Tonal and 3 for Rhythm) and 80 standard questions (40 for each aspect). Each question is scored 1 point, totaling 80 points (practice questions are not included in the total score). In each question, two music segments are played, and children are required to determine whether they are the same, checking the corresponding answer (Gordon, 2013). This scale has been used in the United States for many years, undergoing statistical and practical tests, and has demonstrated high reliability and validity internationally.

After researching music scales both domestically and internationally, it was decided to adapt Edwin Gordon's Primary Measures of Music Aptitude (PMMA) and make modifications. Each audio segment in the test contains a tonal or rhythmic pattern that is easily understandable for children (Gordon, 1976). Due to the large number of original scale items, the entire test takes approximately forty to fifty minutes and is not suitable for preschool children aged 4-6 (Cheng, 2021). In this study, an adapted version of the Primary Measures of Music Aptitude (PMMA) was used, consisting of 20 questions, with 10 questions each for tonal and rhythmic aspects, with relatively low difficulty, making it more suitable for the study subjects. The testing tool utilized pre-recorded instructions and piano playing, and testing was conducted in groups of five children. Tonal and rhythmic tests were conducted separately, with an interval of ten minutes between them, and each group required approximately 20-25 minutes.

Before the test, the adapted PMMA scale underwent reliability and validity tests. Twenty-five children were selected for reliability and validity testing, following Gordon's method of calculating split-half reliability and retest reliability, using the retest reliability of each subscale and the comprehensive test to assess the reliability of the adapted scale and the test sample. The interval between each test ranged from 10 to 14 days. Pearson coefficients were calculated for tonal, rhythmic, and comprehensive tests to describe the correlation between comprehensive tests and subscale tests, assessing the reliability and validity of the adapted scale. Data were analyzed using SPSS 24.0 after collection.

**Discussion and Findings**

This test randomly sampled 150 children aged 4-6 from kindergarten and divided them into three groups, A, B, and C, with 50 children in each group. Groups A and B consist of children who have not received music literacy training, while Group C comprises children who have received such training. The music literacy test scores for Groups A, B, and C are presented in

Table 1
*Tonal Test Score Statistics.*

| Group | M | SD | Minimum | Maximum |
|---|---|---|---|---|
| A | 7.44 | 1.73 | 4 | 10 |
| B | 7.16 | 1.64 | 2 | 10 |
| C | 8.12 | 1.57 | 5 | 10 |

The tonal test consists of ten questions, with a maximum score of ten points. A higher score indicates a better mastery of tonal abilities by the children. The score statistics for the tonal test are shown in the table above, where there are children in Groups A, B, and C who have achieved full marks in the tonal test.

Table 2
*Rhythmic Test Score Statistics*

| Group | M | SD | Minimum | Maximum |
|---|---|---|---|---|
| A | 6.53 | 1.78 | 2 | 10 |
| B | 6.50 | 1.81 | 2 | 10 |
| C | 7.16 | 1.69 | 4 | 10 |

The rhythmic test consists of ten questions, with a maximum score of ten points. A higher score indicates a better mastery of rhythmic abilities by the children. The score statistics for the rhythmic test are shown in the table above, indicating that, compared to the tonal statistics, children in all groups demonstrate slightly lower proficiency in rhythm than in tonality.

Table 3
*Overall Music Aptitude Score Statistics*

| Group | M | SD | Minimum | Maximum |
|---|---|---|---|---|
| A | 13.98 | 2.85 | 8 | 19 |
| B | 13.66 | 2.62 | 7 | 18 |
| C | 15.28 | 3.30 | 9 | 20 |

The adapted music literacy test comprises 20 questions with a total score of 20 points, where a higher score indicates better musical aptitude in children. The overall music aptitude scores are shown in the table above. The results indicate a significant difference between children who have received professional music training and those who have not. During the 4-6 age range, children's musical abilities begin to undergo rapid development. Providing necessary music literacy training during this period significantly enhances children's musical abilities compared to those who have not received such training.

The test reveals slight differences in music literacy among the three groups of children, with Group C, having a foundation in music literacy, exhibiting the highest musical abilities among the tested groups. Many children in this group demonstrate the ability to

independently play instruments such as piano and violin. Although the duration and type of music training vary within Group C, the results indicate a close correlation between timely music training and children's musical literacy. Groups A and B, lacking professional training, show slightly lower musical abilities.

**Conclusion**

The present study has several limitations. Firstly, the grouping of children into three categories based on whether they have undergone professional music training lacks granularity, as it overlooks the distinct developmental characteristics of children aged 4, 5, and 6 years. Secondly, the study's sample size of 150 children from a single kindergarten may not be representative of all children. Therefore, future research should expand the sample size and include children from economically diverse areas, including regions with varying levels of economic development and different types of kindergartens (e.g., provincial, municipal, private, public, rural, and urban).

Furthermore, the study only conducted a single test and did not delve into the specifics of children's music education, such as the duration of their music education or the instruments they have learned. Particularly for children with higher musical abilities, the study did not investigate their family backgrounds, environments, or the specifics of their music education.

Additionally, the comparison of music test scores between children of different genders revealed that overall, female children exhibited significantly higher musical abilities than male children. While this finding aligns with previous studies by Whellams (1973); Shuter-Dyson (1982); Lv (2022), among others, some scholars, such as Ting (2017); Hallam (2004), have reported no gender differences in children's musical abilities. This discrepancy requires further investigation and validation.

This study significantly contributes to the existing knowledge in early childhood music education by empirically demonstrating the positive impact of music literacy training on preschool children's musical aptitude. Theoretically, it validates Gordon's assertion that early music education is crucial for developing musical abilities, emphasizing the critical period of 4-6 years as optimal for cultivating foundational musical skills. Contextually, the research provides valuable insights into the current state of music education in kindergartens in City X, China, highlighting the need for structured and early music literacy programs. By showcasing the superior musical aptitude of children who received music literacy training, this study advocates for the integration of such training into early childhood education curricula, thereby informing educational policy and curriculum development. It underscores the importance of early intervention in music education and its potential to foster a well-rounded developmental experience for young children, ultimately enhancing their creative and cognitive abilities.

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