Bulletin of the Council for Research in Music Education, 127, 28-34 (1995/1996)

# Development of Receptive Vocabulary Skills Through Exposure to Music*

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## Abstract

*This paper focuses on the development of receptive vocabulary skills of students through a program of music activities. Four groups of children aged 6 to 9 years who were experiencing reading difficulties participated in two programs identified with the development of listening skills. The programs were implemented daily by class teachers over a 30-week intervention period. The students were tested prior to the intervention period, at the end of the intervention period, and finally 7 weeks later. The results from the tests indicated a significant effect on the receptive vocabulary of students participating in a music program. The effects of the music were not apparent until the postposttest period. This indicates that a longer time period is required for a statistically significant music effect to show on the receptive vocabulary of students with reading difficulties. The findings suggest that music may be an effective learning medium for aspects of language development such as receptive vocabulary skills, especially for students with reading problems.*

Music, as a means of learning, provides structure, rhythms, and patterns of sound, as well as opportunities for the use of analytical and reflective skills. These processes are similar to those required for learning language. Over the years, music has been favored as a medium for the teaching of language (Graham, 1987). Recently, an emphasis on the use of music as a learning medium for language development has been advocated (Bygrave, 1991; Mills, 1993).

Learning about and listening to sound is paramount in most educators' approach to the teaching of music (Heller, Campbell, & Gibson, 1982; McMahon, 1979; Sims, 1990) and reading (McLullich, 1981; Wisbey, 1981). An awareness of rhyme in teaching children who have poor language skills (Birkenshaw-Fleming, 1990; Bradley & Bryant, 1985; Bryant & Bradley, 1985) has been found to help develop children's literacy skills. Studies have demonstrated the positive effects of music education on the understanding and development of language concepts (Kalmár, 1982, 1989) and the acquisition of reading skills (McMahon, 1982) in preschool children. A relationship between reading and musical ability in children with reading difficulties (Barwick, Valentine, West, & Wilding, 1989) and the reading ability of children involved in Kodály music curriculum training (Hurwitz, Wolff, Bortnick, & Kokas, 1975) and Suzuki training (Weeden, 1971) also has been investigated.

The effects of a music program on the development of listening skills of students experiencing learning difficulties has been examined in a recent study undertaken by this author (Bygrave, 1991). A hypothesis was proposed that through the acquisition of listening skills, associated language skills, such as receptive vocabulary skills, of children would develop through their participation in a music program. Data supporting this hypothesis are presented in the original (Bygrave, 1991) and in the full report of the project (Bygrave, 1994). In the research undertaken, two specific programs, a music program and a story-telling program, were selected as the investigative mediums. The two programs were chosen firstly, for their focus on the development of listening skills and, secondly, for the purpose of introducing a comparative aspect into the study. The musical activities of the music program were seen to provide a variety of listening experiences, and the language-listening activities associated with the story-telling program as a more everyday classroom occurrence.

* The full report of this project is contained in "Development of Listening Skills in Students in Special Education Settings," *International Journal of Disability, Development and Education*, 41(1), pp. 51-60, 1994.



## Procedures

Children identified as having learning difficulties, particularly with problems in reading, took part in the study. These students, 19 males and 10 females, were in special classes attached to four primary schools in the Australian Capital Territory (ACT). The higher proportion of males experiencing learning difficulties has been substantiated by a study conducted by the Australian Council for Educational Research that showed that more males than females had reading problems (Bourke & Keeves, 1977). School records indicated that the children participating in this study were of European descent with similar backgrounds. The average age of the children was 7.7 years (range 6 years 3 months to 9 years 2 months), and the average IQ score was 80 (range 58 to 103).

The music and story-telling programs were implemented by the class teachers in the schools in the ACT, with the classes participating in the study over a period of 30 weeks. One school undertook the music program, another the story-telling program, and the third a combination of the music and story-telling programs. In the fourth school, no program was undertaken. The children in the four classes were tested with a battery of tests before the programs were implemented. These same tests (posttests) were administered at the conclusion of the intervention period of 23 weeks (two school terms) and again 7 weeks later (postposttests). The postposttest was administered to investigate the possibility of retention effects of the intervention programs and effects not previously apparent at the posttest period.

The research to be reported in this paper concerns the measure of receptive vocabulary, one of the measures assembled to test the effects prior to and following the implementation of the music program and the story-telling program.

The Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981) measures receptive language of children aged from 2.5 years through to adults aged 40 years. The PPVT-R has been used in Australia by the National Acoustics Laboratory to assess auditory receptive language in children for the early identification of reading difficulties (Der-

mody, Kehoe, & Bochner, 1989). The test has two parallel forms and contains 350 items (175 items per form).

The test consists of four pictures presented on a series of plates. The child is asked by the tester to indicate which picture on the plate shows for example, "hive" or "angle," items representative of the level of a 7-year-old child. The plates are presented consecutively until a ceiling point of eight consecutive responses containing six errors is reached by the child.

The PPVT-R was administered by two independent testers who were unaware of which intervention program was being implemented in each school. Individual students were withdrawn from their classroom for testing in a quiet room with an appropriate setting. The testing of each student lasted for more than one session with students being monitored for signs of restlessness. The testers marked each test and the student's results were not reported to the teachers.

### Music Program

The music program (Leask & Thomas, 1986) consisted of singing, the playing of musical instruments, movement, creativity, and listening activities. The class teacher implemented the program of musical activities with the children in the classroom on a daily basis. The aims of the program were to provide experiences for the children so that they could acquire a knowledge of musical skills and concepts.

### Story-telling Program

The aim of the story-telling program (Field & Walsh, 1989) was to develop language skills for early reading such as listening, organization, comprehension, and memory skills through the structure of a story. The program involved children listening to short stories read by the class teacher in the classroom on a daily basis. Questions related to the stories also were asked by the teacher.

## Results

A comparison of the pretest scores for the four groups was made prior to the intervention period. The analysis of these scores was not significant. Data collected from the pretests, posttests, and postposttests were analyzed as a two-way factorial treatment (music yes or story no). This analysis was designed to assess whether the implementation of the music program, the story-telling program, or the combination of both the music program and the story-telling program, led to an improvement of listening skills and associated language development of the children. The analysis indicated that music had an effect ($p < .05$) on the receptive vocabulary of the students for the postposttest period (see Figure 1).

Although the development of receptive vocabulary skills appears to have occurred in those groups undertaking a music program, there appears to have been no effect on the development of receptive vocabulary skills in those groups not undertaking a music program. The mean gains on the PPVT-R for the groups for the postposttest were: No music and no



story, .00 ($N = 6$); music and story, 2.56 ($N = 9$); story, –1.00 ($N = 6$); music, 5.25 ($N = 8$).

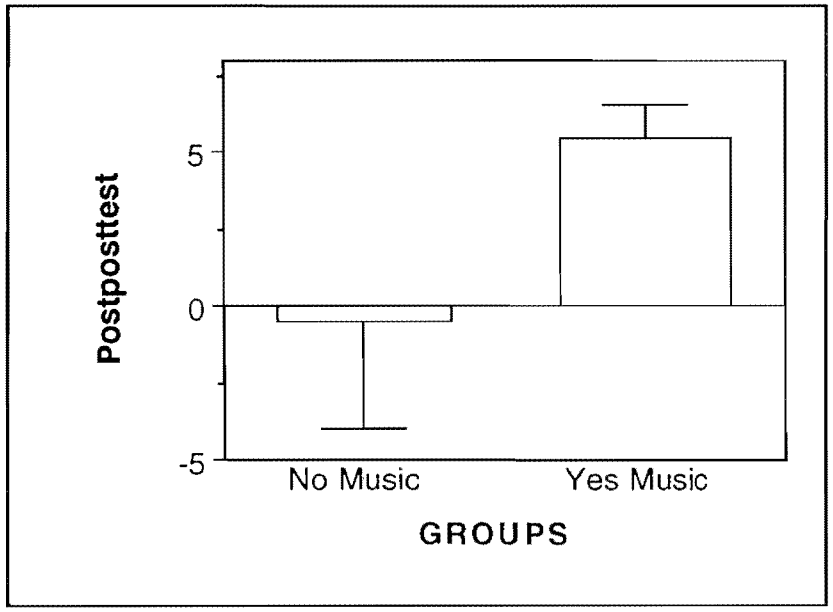


**Figure 1.** Mean of Postpost-Posttest for PPVT-R scores and 95% Confidence Interval for Music and No Music groups.

## Discussion

This paper has examined the development of receptive vocabulary in students with learning difficulties. It was hypothesized that listening skills and associated language skills of the students, such as receptive vocabulary skills, would develop through participation in a music program. This hypothesis appears to have been substantiated by data which indicate an improvement in the receptive vocabulary skills of the students participating in the music program (Bygrave, 1991, 1994).

It is of interest that a music effect for the PPVT-R was not apparent until the postposttest. This finding suggests that a longer period of time is needed for a significant music effect to show on receptive vocabulary skills, as measured by the PPVT-R. Such a finding appears consistent with studies by Hurwitz et al. (1975), who found that the development of reading skills in young children involved in a music program over a prolonged period of time had accelerated. Weeden (1971) also suggested a long-term effect of a music program on reading skills.

There are several possible explanations which could account for the late or delayed effect. Of course, an additional variable could have been introduced between the posttest and the postposttest for the music group(s). One explanation concerns the acquisition of listening skills. The acquisition of listening skills by the students participating in the music

program may have required a longer time span to impact on the receptive vocabulary of the students. This study points to a progressive development of the children's knowledge, skills, and understanding. The application of these by the children in a learning context is central to the process of metacognition wherein children learn to know, apply, and regulate their own cognition in learning (Brown, Bransford, Ferrara, & Campione, 1983; Flavell, 1985; Pramling, 1990). It is, therefore, suggested that the knowledge, understanding, and skills the students acquired in gaining understanding of new concepts and an awareness of sounds through the music activities would gradually become central to the linguistic concepts needed to enhance receptive vocabulary.

This suggestion can be linked to another explanation concerning the application of newly acquired knowledge and skills to other areas outside the activities of a music program. It was apparent from interviews with the teachers implementing the music program that knowledge and skills acquired by the students in the music sessions were gradually applied to other general activities and to curriculum areas involving language. Although the issue of the transfer of general cognitive skills to domain-specific areas such as language continues to be debated (Perkins & Salomon, 1989), it would appear from this study, that cognitive skills gained through music activities may aid in the development of language skills such as receptive vocabulary skills.

Alongside possible explanation, independent variables associated with implementing programs like these in an educational setting need to be considered when discussing the implications of this research. In a study of this nature the resulting data, for example, could be affected by the different teaching styles and attributes of the class teachers. The researcher also could be seen to have an impact on the teachers, and students as individuals or as a member of a group, must be considered as affecting significant differences on data results.

The potential of specific programs to develop language skills, such as receptive vocabulary skills, in children through activities associated with listening skills has received little or no attention (Bygrave, 1994). This is particularly so in regard to students with learning difficulties (Bygrave, 1991). This study, which involved students with reading problems participating in music and story-telling programs, has implications for music education in that data presented in this paper appear to indicate a relationship between music activities and the development of receptive vocabulary. Such a finding is pertinent for all children learning to read, particularly those children with learning difficulties who experience problems with rhythm patterns and tonal discrimination in comparison to normal-achieving readers (Atterbury, 1985). Further studies investigating the use of a music program as a learning medium to develop language-related skills such as receptive vocabulary, thus appear warranted.



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