

Chapter Three

EXPERIMENTAL METHODOLOGY

3.1 Introduction

The study was concerned with exploring the impact of a music program on the listening skills of younger students with learning difficulties who attended a Junior Assessment Class (JAC) in the ACT. In designing the study, a number of important issues had to be addressed, the most important of which included the identification and trialling of specific tests to measure listening skills and the identification and trialling of a music program to develop these skills.

This chapter discusses the experimental method by which these issues were addressed, namely a pilot study. Conducting a pilot study also allowed for the consideration of factors which might relate to the feasibility of the research study; these factors included the length of time for an intervention program to be satisfactorily implemented, teacher-commitment to an intervention program and teacher-accessibility to an "outsider" for interviews, classroom observations and video-sessions.

3.2 Identification of tests

Much consideration was given to the selection of specific tests used to measure various aspects of listening in children. Concerns regarding the test selection related to the suitability of the tests for use with a particular population, namely students with learning difficulties, and to what actually was being measured in the

students by the tests since, as discussed in Chapter Two (2.6.6), the listening process is complex.

Prior to undertaking the pilot study in 1988, various language-related tests, and evaluations of language-related tests (Banks, Fordham, Steele & Troth, 1981; Burns & Richgels, 1988), were examined for their appropriateness to measure different aspects of listening such as receptive vocabulary, phonological processing, and listening comprehension. As discussed in Chapter Two (2.6.6.4), listening has been identified as involving cognitive processes (Alley & Deschler, 1979; Barbara, 1958; Barker, 1971; Floyd, 1985; Robinson, 1983, 1989; Robinson & Smith, 1981; Wilkinson *et al.*, 1974) and cognitive skills (Anderson & Lynch, 1988; Wolvin & Coakley, 1985). The literature also was examined for the purpose of adapting existing tests for use in measuring language skills in children in special education settings (Becker, Engelmann & Thomas, 1975; Bradley & Bryant, 1978, 1983, 1985; Salvia & Ysseldyke, 1988), and for the measurement of specific aptitudes and abilities in music (Aronoff, 1979; Bentley, 1966b, 1973; Davies, 1978; Gardner, 1983; Gordon, 1984; Phelps, 1986; Shuter-Dyson & Gabriel, 1981).

Tests initially perused for measuring listening in relation to language included the Basic Language Concepts Screening Test (Macquarie University Special Education Centre, 1980), the Basic Language Concepts Test (Engelmann, Ross & Bingham, 1986), the Boehm Test of Basic Concepts (Boehm, 1986), the Developmental Skills Inventory (Pieterse, Cairns & Treloar, 1986), the Early Childhood Assessment Tool (Narrabundah Early Childhood Education Centre, 1983), the Environmental Language Inventory (MacDonald, 1978), the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy & Kirk, 1968), the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981), the Portage Guide to Early Education-Checklist

(Bluma, Shearer, Frohman & Hilliard, 1976), the Preschool Inventory Revised Edition (Caldwell, 1970), the Preschool Language Scale (Zimmerman, Steiner & Pond, 1969), the Reynell Developmental Language Scales (Reynell, 1969), the Test of Early Language Development (Hresko, Reid & Hammill, 1981), the Test of Language Development-Primary (Newcomer & Hammill, 1982), and the Token Test (DeRenzi & Vignolo, 1962; Mackie & Dermody, 1981; Noll & Berry, 1969; Whitaker & Noll, 1972).

Tests related to measuring auditory processes and musical abilities also were examined; these included the Goldman-Fristoe-Woodcock Auditory Skills Test Battery (Goldman, Fristoe & Woodcock, 1974), the Lindamood Auditory Conceptualisation Test, Revised Edition (Lindamood & Lindamood, 1979), the Measures of Musical Abilities (Bentley, 1966b), the Measures of Musical Talents (Seashore, Lewis & Saetveit, 1960), The Musical Ability Test (Dickinson, 1976), the Musical Aptitude Profile (Gordon, 1965), the Sequenced Inventory of Communication Development (Hedrick, Prather & Tobin, 1975), the Standardised Tests of Musical Intelligence (Wing, 1961), and the Tests of Musical Ability and Appreciation (Wing, 1968).

Mathematical tests also were examined for the purposes of measuring educational skills outside language to demonstrate possible connections between the listening skills training and other curriculum areas such as mathematics (Bradley & Bryant, 1983; Bryant & Bradley, 1985). These were the Kelvin Grove Numeration Diagnostic Profile (Booker, Irons, Jones & Reuille, 1979), the Newman Language of Mathematics Kit (Newman, 1983), the Special Education Centre Kindergarten Maths Test (Macquarie University Special Education Centre, 1984a), and the Special Education Centre

Year 1 Maths Test (Macquarie University Special Education Centre, 1984b).

3.2.1 The NALTALLCK measures

During the period in which tests were being reviewed for possible trial in the pilot study, the researcher became aware of a series of investigations into basic auditory receptive language skills such as lexical retrieval, phonological processing and listening comprehension that had, for some time, been a research focus for the Speech Communication Research (SCR) group of the National Acoustics Laboratories (NAL). Prior to the development of the National Acoustic Laboratory Test of Auditory Language Learning Capabilities in Kindergarten Children (NALTALLCK) (Dermody, Kehoe & Bochner, 1989), standardised tests such as the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965), the Lindamood Auditory Conceptualisation Test (LAC) (Lindamood & Lindamood, 1971) and the Token Test (DeRenzi & Vignolo, 1962; Mackie & Dermody, 1981; Noll & Berry, 1969) were used by the SCR at NAL to assess auditory receptive language in children with poor language development. Other informal measures used by the SCR to validate areas of auditory receptive language, related to listening comprehension such as story passages and story sequences, and to rhyme and sound-blending.

NALTALLCK (Dermody, Kehoe & Bochner, 1989) comprises three components - a receptive vocabulary test, a rhyme test and a modified forced-choice Token Test, and was designed to identify auditory receptive language problems in ordinary school kindergarten children aged from five to seven years. At the time of the pilot study, NALTALLCK was in the process of being assessed as

a group test procedure. Data from this assessment and the standardisation of NALTALLCK are discussed by Dermody, Kehoe & Bochner (1989). For the purposes of this study, only details relevant to the Rhyme Test which was included in the research study, will be considered.

3.2.2 Tests

Five tests were selected to be trialled and were administered for the pilot study. The tests included the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the Lindamood Auditory Conceptualisation Test-Revised (LAC-R) (Lindamood & Lindamood, 1979), the Token Test (DeRenzi & Vignolo, 1962; Mackie & Dermody, 1981; Noll & Berry, 1969), the Basic Language Concepts Screening Test (BLCST) (Macquarie University Special Education Centre, 1980), and the author's Aural Receptive Sound Concept Test (ARSCT) (Bygrave, 1988a). The ARSCT was designed to measure certain basic language concepts aurally such as those measured by the BLCST.

A battery of seven tests (see Table 3.1) was finally assembled to measure different aspects of listening and mathematics for the research study undertaken in 1989. Five of the tests were the same as those used in the pilot study. The two additional tests administered were the Rhyme Test (NALTALLCK) (Dermody, Kehoe & Bochner, 1989) and the Kelvin Grove Numeration Diagnostic Profile (Booker *et al.*, 1979).

In the following discussion, the tests will be described in relation to their content, administration, and any other features considered relevant to the testing purpose. Data relating to the

reliability and validity of each of the tests administered is appended (Appendix B).

Table 3.1

The Test Battery

Test	Function measured
Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981).	Receptive vocabulary
Lindamood Auditory Conceptualisation Test-Revised (LAC-R) (Lindamood & Lindamood, 1979).	Phonological processing
Rhyme Test (Dermody, Kehoe & Bochner, 1989).	Phonological processing
Token Test (DeRenzi & Vignolo, 1962; Mackie & Dermody, 1981; Noll & Berry, 1969).	Listening comprehension
Basic Language Concepts Screening Test (BLCST) (Macquarie University Special Education Centre, 1980).	Receptive language concepts
Aural Receptive Sound Concept Test (ARSCT) (Bygrave, 1988a).	Receptive sound concepts
Kelvin Grove Numeration Diagnostic Profile (Booker, Irons, Jones & Reuille, 1979).	Mathematical concepts

3.2.2.1 Peabody Picture Vocabulary Test-Revised

The Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981) measures receptive language of children aged from two years six months through to adults aged 40 years. The unrevised version of the PPVT (Dunn, 1965), was used by NAL in

previous studies to assess children's word knowledge (Dermody, Kehoe & Bochner, 1989). The PPVT-R norms have been based on a wider USA population than those for the PPVT, to include children from low socio-economic areas and from ethnic backgrounds. The revised version contains increased test items which "reflect a more appropriate racial, ethnic, and gender representation" (Wiig, 1985). The PPVT-R consists of two parallel forms (Forms L and M) and contains 350 items (175 items per form). For the study, Form M was administered.

The test consists of four pictures presented on a series of plates. The child is asked by the testor to indicate which picture on the plate shows for example, "a whale" or "catching," items representative of the five-year-old child level on the PPVT-R Test Form M. The plates are presented consecutively until a ceiling point of eight consecutive responses containing six errors is reached by the child.

3.2.2.2 Lindamood Auditory Conceptualisation Test-Revised

The Lindamood Auditory Conceptualisation Test, Revised Edition (LAC-R) is "an individualised test designed to measure auditory perception and conceptualisation of speech sounds" (Lindamood & Lindamood, 1979, p. vii). The unrevised version of the LAC (Lindamood & Lindamood, 1971) was used by NAL to assess the phonological processing skills of children prior to the development of the NALTALLCK measures (Dermody, Kehoe & Bochner, 1989). LAC and LAC-R have been used widely in Australia as an assessment and diagnostic tool by speech pathologists and educators with children experiencing language problems.

The test involves encoding tasks similar to those encountered in reading and spelling. A set of coloured blocks is manipulated by the child to represent concepts of number, same or different sounds, and sequences in speech sounds, in response to a spoken command by the testor. There are two major categories in the test. Category One tests sounds isolated in a sequence and has two parts. In Part A the child is presented with concepts of number, and same and different sounds in a sequence, for example, /b/b/b and / t / k. In Part B two similar sounds followed by a different sound such as / d / d / j /, are presented in a sequence, or, a similar sound is presented at the beginning and end of a sequence, for example, /d/j/d/. Category Two tests sounds in a syllable sequence by the child responding with a block pattern, for example, "If this shows ap show me pa." Two columns of block patterns are presented in Category Two, with each column alternating with a substitute pattern when a mistake is made by the child.

Testing in Category One discontinues after the child makes five consecutive errors and in Category Two after five total errors are made between the two alternate patterns.

3.2.2.3 Rhyme Test

The Rhyme Test is one of the three sets of NALTALLCK (Dermody, Kehoe & Bochner, 1989) screening measures "designed to detect a proportion of children who are at risk for auditory receptive language difficulties" (Dermody, Kehoe & Bochner, 1989, p. 22). The Rhyme Test measures the phonological processing skills of children through the blending of rhyme and sound in words presented to the children. Research into rhyming tasks (Bradley & Bryant, 1978), sound categorization (Bradley & Bryant, 1983), the

role of rhyme in children learning to read and spell (Bradley & Bryant, 1985), and the relationship between children's early knowledge of nursery rhymes and learning to read (Maclean, Bryant & Bradley, 1987), has indicated that phonological awareness is linked with children learning to read. The use of nursery rhymes in teaching language skills such as word recognition, to children with Down syndrome also has been demonstrated (Glenn & Cunningham, 1984).

In administering the test, the testor presents a set of four pictures to the child, names each picture, and supplies an additional word which rhymes with one of the names of the four pictures. The child marks the picture that rhymes with the additional word spoken by the testor. The NALTALLCK Test Items and Administration Details (Dermody, Kehoe & Bochner, 1989) provides an example:

Do you know what 'sounds the same' means? Can you think of some words that sound the same as CAT? I want you to mark the picture that sounds the same as that word (p. 4).

The set of four pictures presented to the child could include a nut, a clown, a bone and a hat. The correct response by the child to the above example would be the marked picture of a hat. A total of fifteen sets of four pictures is presented to the child. A score of three was selected from the NALTALLCK field studies as the cut-off point for the Rhyme Test which would "identify a proportion (6.4%) of the lowest performing subjects" (Dermody, Kehoe & Bochner, 1989, p. 22).

3.2.2.4 Token Test

The Token Test (DeRenzi & Vignolo, 1962) was originally developed to measure milder forms of receptive language dysfunction in aphasic adult patients. DeRenzi and Vignolo (1962) describe the test as making:

Two kinds of demand upon the comprehension of the patient: one arises out of the difficulty of identifying a particular token specified by three independent features and the other from that of grasping the semantic complications introduced by the . . . [use] of language (p. 673).

The Token Test was subsequently adapted for use with children (DiSimoni, 1978; Noll & Berry, 1969; Whitaker & Noll, 1972). Studies involving the Token Test (DiSimoni & Mucha, 1982; Mackie & Dermody, 1981; Morice & Slaghuis, 1980; Robinson, 1983; Tallal, 1975) and modifications of the Token Test (Evans & O'Callaghan, 1987; Dermody, Kehoe & Bochner, 1989), have identified the test as a measure of auditory receptive language abilities.

A study by Mackie and Dermody (1981) using a version of the Token Test similar to that of Noll and Berry (1969), established data on group means for Australian children aged five to twelve years which showed that the test differentiates age-groups of children. The Mackie and Dermody (1981) study suggested the Token Test was "useful as an identification measure of children with auditory comprehension problems and could be incorporated into an identification battery for these populations" (p. 21).

The Token Test consists of 20 tokens. The tokens are of two different shapes (circles and squares), two different sizes (big and small), and of five different colours (red, white, blue, yellow and

green). There are a total of 61 commands in the test which are grouped into five parts. The five parts become progressively more complex in the commands spoken by the testor to the child who responds by manipulating the tokens. The first spoken command by the testor to the child in Part One, for example, is to "Point to the yellow square" and the last command in Part Five is "Before touching the yellow circle pick up the red square."

3.2.2.5 Basic Language Concepts Screening Test

The Basic Language Concepts Screening Test (BLCST) (Macquarie University Special Education Centre, 1980) is a criterion check-list developed to measure basic language concepts related to size, position, direction, quantity, mass, temperature, sets and volume. In Australia, school counsellors, educators, advisors and teachers in special education, have found the test useful in assessing children experiencing language concept difficulties (S. Bochner, personal communication, November 28, 1990).

The test presents each concept in a picture. The child responds to verbal instructions from the testor such as:

Point to . . .' or 'Put your finger on' depending on the level of language development of the child (Test Directions, p. 2, 1980).

For the pilot study, 20 items were selected from the test such as long, short, heavy, light, strong, weak, high, low, up, down, same, different, step, leap, thick, thin, fast, slow, loud and soft, to assess the child's knowledge of these concepts.

In the research study, a total of 16 concepts was presented to the child to correspond with similar concepts tested by the Aural

Receptive Sound Concept Test (Bygrave, 1988a). The items eliminated were strong, weak, thick and thin.

3.2.2.6 Aural Receptive Sound Concept Test

The Aural Receptive Sound Concept Test (ARSCT) (Bygrave, 1988a) was designed to measure whether children in a special education setting could attend to and listen to selected musical sound concepts and then verbally identify those concepts only through listening. The purpose of the test was to determine if children had the aural receptive recognition of a concept as well as the visual receptive recognition of that concept. The rationale behind the test design was developed through an examination of appropriate literature, tests and research studies related to the development of music concepts and auditory discrimination in children. A synopsis of that examination now will be discussed.

The acquisition of music concepts in children such as high-pitched and low-pitched sounds, long and short sounds, loud and soft sounds, has been investigated by music educators and researchers (Dowling, 1982; Pirtle & Seaton, 1973; Scott, 1979; Serafine, 1988; Sims, 1990; Webster & Schlenrich, 1982; Zimmerman, 1984). The research has revealed there are characteristics that link the development of music concepts with developments in language (Barwick, Valentine, West & Wilding, 1989; Crowther & Durkin, 1982; Jackendoff & Lerdahl, 1982; Kalmár, 1989; Karma, 1984; McMahon, 1982; Pirtle & Seaton, 1973).

Tests have been designed to investigate the development of musical concepts in young children aged five to seven years (Buckton, 1982); in ESN children - "children spanning the chronological age range of eight to 14 years, with IQs on the WISC

scale varying between roughly 50 and 90, and Mental Ages varying between approximately five years and 10 or 11 years" (Dickinson, 1976, p. 63); and in neurologically-handicapped children - "children with mental ages of six years or below, as determined by performance on either the Leiter International Performance Scale or the Vineland Social Maturity Scale" (Pirtle & Seaton, 1973, p. 294).

Auditory discrimination and sound differentiation occurs early in children. Tests measuring development in children such as the Griffiths Mental Development Scales (Griffiths, 1970), the Denver Developmental Screening Test (Frankenburg, Dodds, Fandal, Kazuk & Cohrs, 1975) and the Bayley Scales of Infant Development (Bayley, 1969) indicate that response to sound occurs in the first month of a child's life. The Sequenced Inventory of Communication Development (SICD) (Hedrick *et al.*, 1975) measures responses to non-speech sounds such as cellophane and rattle sounds, from four to eight months. As noted earlier (see Chapter Two, 2.9), a study by Reis and Van Bloem (1990) found that infants from birth could apparently respond and match the sung pitched vocalisations of their parents.

Research has shown that preschool children can recognise and discriminate between musical concepts (Aronoff, 1979; Kalmár, 1989; McMahan, 1982; Sims, 1990; Zimmerman, 1984). A problem however, associated with tests measuring the child's development of musical concepts, is "the difficulty of ensuring that both adults and children have the same understanding of words used" (McMahan, 1985, p. 131). In response to this problem, McMahan (1985) and other researchers (Scott, 1979; Sims, 1990; Webster & Schlenrich, 1982) have devised non-verbal means for measuring young children's music concept development by the child

responding by using, for example, pitched percussion instruments, movement or singing.

A non-verbal response to an expressive form of the ARSCT was trialled in the pilot study. In response to the testor's verbal request to play a musical concept, the child played a pitched percussion instrument. Both the researcher and the class teacher administered receptive and expressive forms of the ARSCT during the pre-test and the post-test periods. At the conclusion of these testing periods it was felt that a verbal response would be a less distractive form of measurement for the child in a special education setting and would provide for a testing environment more conducive to listening. The expressive form of response also disadvantaged many of the children who previously had not played pitched percussion instruments. These children experienced difficulty in manipulating the instruments, especially during the pre-tests.

The ARSCT was constructed using paired music concepts such as loud and soft, high and low sounds (McMahon, 1982), and the scoring procedure was based on that of the SICD sound discrimination Item 24 (Hedrick *et al.*, 1975, p. 40) wherein if two of three parts are correct the item is correct.

The testor presents the test to the child who sits in a chair, with his/her back turned, approximately two metres from a table. On the table are musical percussion instruments such as chime bars, a latin drum, cymbals, a whistle and a bamboo pipe. Prior to the test, the child is shown the instruments and told he/she will be listening to the sounds made by these instruments. The child is asked to listen to the sounds played by the testor:

Testor: I want you to listen to these sounds. This is a long
sound
(A long sound is played on a chime bar by the testor).

Testor: This is a short sound (A short sound is played on the same chime bar by the testor).

Testor: Listen to this sound and tell me if it is a long or a short sound (Either a short or a long sound is played on the same chime bar by the testor).

The testor randomly presents three examples for each pair of concepts to eliminate possible answer prediction by the child.

In the trialling of the test, ten pairs of concepts were measured for each child. These paired concepts were reduced to eight for the research study; long/short, heavy/light, high/low, up/down, same/different, step/leap, fast/slow, loud/soft.

In November 1988, the ARSCT was administered by the researcher to 133 children, 69 males and 64 females, in three ordinary primary schools in the ACT. The children were randomly assigned to participate in the testing with every second child on the class roll being selected. The children were of the same age range as the children in the JAC (that is, five to nine years) and in similar school-grades (Kindergarten to Grade Three). The testing procedures were the same as those presented to the children in the JAC for the pilot study.

The purpose of administering the ARSCT to children in mainstream classes was to assess whether:

1. The concepts presented by using the musical percussion instruments could be verbally identified by children listening.

2. Similar aural concept difficulties would be encountered by children in a special education setting and by children in mainstream settings.

3. Any of the concepts in specific music components such as long and short in the beat component, or high and low in the pitch component, presented more difficulties in aural testing presentation than other concepts.

The trialling of the ARSCT with the children in the mainstream classes led to the following conclusions:

1. The concepts presented by using the musical percussion instruments could be verbally identified by the children listening.

2. Similar aural concept difficulties were encountered by the children in the mainstream as by the children in the JAC such as in the music component of pitch. There were, however, fewer instances of difficulty found with the mainstream children.

3. Difficulties were experienced in aurally presenting and measuring certain aural concepts.

Difficulties in aurally presenting and measuring the concepts of strong and weak in the music component of beat, and thick and thin in the music component of texture had been encountered while testing the JAC children in the pilot study. Similar difficulties also were experienced in testing the children in the mainstream classes with the concepts of thick and thin.

3.2.2.7 Kelvin Grove Numeration Diagnostic Profile

The Kelvin Grove Numeration Diagnostic Profile (Booker, Irons, Jones & Reuille, 1979) is a taxonomy which measures gaps in numeration knowledge (G. Booker, personal communication, November, 1990). The profile has been constructed to cover the content areas of whole numbers and decimals. Numbers are ranged in levels, for example, 1-10, 11-19, 20-99, in the content areas which become progressively more difficult. Within each of the levels are specific tasks related to place values, comparison, sequencing and representations of numbers.

3.2.3 Trialling the tests

As stated above (3.2.2), five tests were selected to be trialled in the pilot study. These tests were first administered to ten students in a JAC by the researcher in the week prior to the commencement of a music program in that JAC. The tests also were administered to nine of the students (one student had left the class) at the conclusion of the implementation of the music program (eight weeks), and again seven weeks later, to the same number of students.

3.3 Identification of a music program

Prior to the pilot study, a number of music programs currently in use in ordinary Australian primary schools (see 2.8.2.1) were examined for their adaptability to a special education setting. Two alternatives were considered: either to select a music program currently being used by teachers in ordinary Australian primary schools, or to design a specific music program centered around activities and experiences involving singing, listening, playing musical instruments, movement and creating. The use of an existing music program was considered preferable as less time and expense would be involved compared to that of designing, preparing and trialling a new music program. The main criteria for selecting an appropriate music program included the following:

1. The program should include components that would complement the goals of the researcher; that is, to develop listening skills in students with learning difficulties.
2. The program could be implemented by a class teacher with no musical background, no musical teaching experience, and with no

confidence in teaching music to children, or in their own musical ability ("But, I can't sing!").

3. The program should be easy for a teacher to implement and use without prior teacher training and much teacher preparation.

4. The program should be adaptable to home-classroom use and easy to transport and manage.

5. If musical tapes were part of the program, these should be of a quality recording.

6. The music in the program should consist of "catchy" tunes, and that the words of the songs should be simple and readily understood by students in a JAC.

7. The music program should have an Australian ethos and be a recent publication.

Following considerable investigations, discussions with music consultants in both the ACT State and Catholic Education systems, and observations of various music programs in classroom use, a music program was located which appeared to meet the above criteria for use in a JAC.

3.3.1 Trialling the music program

The music program was first trialled in the pilot study. The activities in the music program centred around singing, listening, playing musical instruments, movement and creativity. The program emphasised learning the components of music such as beat, pitch, tempo, dynamics, and form, through these musical activities. Besides the musical activities, opportunities for varied musical experiences were presented in the program such as the adaptation of games to a musical context, the sharing of music-creations with a partner or the class group, and the singing of songs incorporating movement. A typical music lesson could combine all

three such experiences and involve all of the various musical activities.

The purpose of trialling a music program in a pilot study involving both the children and the teacher in a JAC was four-fold:

1. To identify whether a class teacher with no musical experience could implement a music program with children in a special education setting such as a JAC. In a different context in Britain, studies by Ward (1976b) had found that non-specialist music teachers could successfully initiate music activities with slow-learning children.

2. To identify an activity in a music program that could be measured. The activities in a ordinary primary school music program usually include singing, listening, playing musical instruments, creating and movement.

3. To trial a test (ARSCT, Bygrave, 1988a) designed to assess children's knowledge of concepts of sound.

4. To identify a set of measures which could assess the auditory receptive skills of receptive vocabulary, phonological processing, and listening comprehension, in association with an intervention program such as a music program, in children in a special education setting.

The music program was introduced into a JAC in the third school term by the class teacher who had had no previous experience in teaching music. Prior to the introduction of the music program, the researcher met twice with the class teacher to discuss the implementation of the program. Issues such as the period of time the program would be implemented, the measures to be used in testing the children, permission by the children's caregiver/s to their participation in the testing and the program, and visits by the researcher to the JAC during the implementation of the music program, were discussed.

Ten students in the JAC were involved in daily musical activities of approximately ten to fifteen minutes duration with the teacher in the JAC over a period of eight weeks. During this period, the researcher visited the JAC each week to observe a music lesson and to interview the teacher.

3.4 The pilot study

In 1987, permission to conduct a research study in local JACs was sought by the researcher from both the ACT Schools Authority Evaluation Section and the Special Education Section of the ACT Schools Authority. In the ACT, a JAC provides special education facilities to children aged from five to nine years who are experiencing learning difficulties in a school environment. These classes are attached to an ordinary primary school with a teacher and a full-time assistant providing learning assistance to a maximum of ten children. There are a variety of JAC models varying from full to partial mainstreaming of the JAC children. Each class usually services children from a number of schools in the surrounding area.

Upon receiving approval from the ACT Schools Evaluation Section, the Executive Officer of the Special Education Section of the ACT Schools Authority contacted principals of five primary schools with an attached JAC to inform them of the proposed research study. A copy of the letter forwarded to each of the five school principals is appended (see Appendix B). The school principals were subsequently contacted by the researcher in March 1988, and all expressed interest in having the JAC attached to their school participate in the study in 1989. Also in March 1988, a school principal and a class teacher of a JAC attached to a primary school

in the ACT, agreed to participate in a pilot study during the third and fourth school terms of 1988.

As noted above, a music program was piloted in a JAC in the ACT for students with learning difficulties and who were in the age range of five to nine years. The children in the JAC involved in the pilot project were fairly typical of the JAC population. Prior to their placement in the JAC all of the children had been identified in ordinary preschool and primary school settings, or through a clinic, as having problems associated with learning. The children in the JAC, measuring IQ's ranging from 101-69, had been identified as "slow to learn" and "frequently off-task". One child (male) had problems associated with English as a Second Language (ESL). The children were placed in the JAC after assessment by a school counsellor, and consultations between the school principal, JAC teacher and the children's caregiver/s.

3.5 Outcomes of the pilot study

The trialling of five tests to measure different auditory receptive skills, and the trialling of a music program to assess its suitability for use with children experiencing learning difficulties, led to additions and to adaptations in both the group of tests and the music program for the research study.

3.5.1 Outcomes of the tests

Of the five tests trialled, all appeared adequate for the purposes of monitoring and measuring auditory receptive skills before and after the implementation of a music program. As was noted in a previous section of this chapter (3.2.2), two additional

measures were included in the test battery (see Table 3.1) for the research study. The Rhyme Test (Dermody, Kehoe & Bochner, 1989) was added to supplement the measurement of phonological skills, and the Kelvin Grove Numeration Diagnostic Profile (Booker *et al.*, 1979) (hereafter referred to as the Maths Test) was selected to measure educational skills outside the language curriculum area, namely those of mathematics.

The trialling of the ARSCT (Bygrave, 1988a) with students in a JAC and students in mainstream classes, found that both groups experienced difficulties with the music component of texture and its associated concepts of thick and thin. Such a finding appeared contrary to the studies of Serafine (1988) discussed in Chapter Two (2.8.2). It also was found that the students in the JAC had difficulties in distinguishing between the concept of strong and weak beats and of heavy and light beats. As the students appeared to have more problems with the concept of strong and weak beats it was decided to delete these concepts along with the concepts of thick and thin from the test for the research study.

3.5.2 Outcomes of the music program

The pilot study demonstrated that a teacher with no previous music learning or teaching experience could implement activities from a carefully selected music program with five to nine-year-old children in a JAC special education setting. It was observed by the researcher and the teacher, however, that portions of the music program were not suitable for use with children who had learning difficulties. Some of the music experiences associated with movement for example, presented rhythmic difficulties for some children, and in singing, problems were encountered in some

instances, with the words of the songs. This led to an adaptation of the music program for the research study with various musical experiences and activities extracted for use by the teachers implementing the music program.

It appeared from the weekly observations of the music program that listening, as one of the activities in a music program, could be identified as a possible means for measuring the development of auditory receptive skills. These skills, such as receptive vocabulary, phonological processing and listening comprehension skills, were seen to be associated with the listening component of the music program.

In a discussion with research advisors following the pilot study, it was suggested that the results from the implementation of a sole program such as a music program, would be null. The outcome of the discussion was the decision to implement another program in conjunction with the music program for the research study. It was decided that another program aimed at developing listening skills such as a story-telling program, would introduce a suitable comparative element into the study.

To add a further comparative aspect to the study, it also was decided that a group of younger students in a special class in NSW, would act as a contrast group to the four JAC groups of older students in the ACT; this would allow comparisons to be made between experimental data from the students in the JAC groups and from the students in the NSW group.

3.5.3 Other outcomes

Factors, such as the optimum time-period for implementing an intervention program, the commitment of a teacher to this time-

period and to a program, and the availability of a teacher and children for observations including video-sessions and interviews, were considered during the pilot study.

In an interview at the conclusion of the music program in the JAC, the teacher commented that the eight-week period for the music program was too short for both the teacher and the children. From her viewpoint, it had taken some time to adjust to teaching an unfamiliar subject and program as well as to accommodate the program in the daily timetable; the children in the JAC were mainstreamed each afternoon and there were constant interruptions to the morning timetable. The teacher also found that the children did not respond as quickly to the program as she had anticipated. The children had difficulties in understanding concepts of sound through listening as "they were not used to listening." She felt two school terms would be a suitable time-period for implementing a music program.

The teacher was especially interested in physical education and the children in the JAC participated in a physical education session with the teacher in the school hall during the morning of each school day; these sessions often followed the music session in the classroom. It was observed by the researcher, that from Week 2 until the end of the pilot study the teacher frequently used the physical education sessions to reinforce concepts from the music program such as high and low, through movement. The children, for example, used the trampoline for high and low movement. They bounced high on their feet and low on their bottoms to instructions given by the teacher using a high or low voice tone. The children watching the activity also participated by responding with high or low voices to the movement executed by the child on the trampoline.

There were no apparent problems regarding the commitment of the teacher to teaching music, which at first she was not confident about doing, or to undertaking an unfamiliar program, and she was readily available for interviews and for observations of the music lessons.

3.6 Summary

In this chapter the issues of selecting appropriate tests and the selection and trialling of a suitable music program have been discussed. Factors necessary for the successful implementation of a program such as the time-period for an intervention program, teacher-commitment and teacher-accessibility during that period, also were considered. A pilot study showed it was feasible that a research study could be undertaken with teachers and children in a JAC using the experimental methods described; that is, a test battery and an intervention program. The methodology used in the research study is discussed in Chapter Four.