An investigation into children's ability to recognise pitch and/or rhythmic sequence patterns.

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Introduction

Two aspects of good potential in the data from the NEMP music tasks concerned musical perception and sightreading. It was while working on the study of aspects of children's sightreading, that it became apparent in the singing tasks, that some who failed to sing in tune or in time, or who sang wrong notes and/or wrong rhythms, nevertheless recognised and sang repeated patterns more or less accurately. The keyboard sightreading tasks revealed the same feature. So it was decided to examine this more closely, using data obtained from viewing samples of four different tasks.

It was also found that, within the focus, there was other, related information that could be usefully examined. This is given in the three following supplementary sections.

Researchers have for long been interested in the way in which musical information is received, processed and interpreted. It could be, and has been argued that many of the musical tasks in the NEMP music project were perceptual/cognitive rather than musical. It can be counter-argued that the teacher's role is to sharpen the child's perceptual skills, and as a result make it possible for aural percepts to take on musical meaning.

Harold Fiske (1992) states that "Music cognition is about pattern management and organization; ... The emphasis here is on the word "pattern", and although such emphasis is not new to psychological theory (the Gestalt school comes quickly to mind), the idea that music cognitive processes begin with patterns of perceived tonal-rhythmic material rather than discrete, isolated tones is, from the point of view of many contemporary theorists, long overdue."

The ages of the children in the samples, preclude any claims that this study tests "the idea that music cognitive processes begin with patterns ...", but it does reveal various aspects of perceptive patterning that are of interest to the teacher.

Related to pattern management is the theory that musical perception is a particular form of symbolising, and that for symbols to take on meaning they must have a context within which that meaning can be recognised.

One of the more difficult tasks is the isolating of the various elements that make up the musical experience. Theorists generally agree that our perception of music is under the control of Gestalt principles. Rhythm and pitch especially are closely linked in drawing musical meaning from a melody, and many studies have been carried out on the perceptual relationships of pitch and rhythm. The removal, or non-recognition of one of these basic elements will easily destroy recognition of a previously familiar melody. Consequently, many of the NEMP tasks, such as the pitch exercises in Keyboard, despite their intentions, may not have been perceived by the children who did them, as musical, even though, from a teacher's angle they are important means to musical ends.

A number of studies, in particular those of Fiske (1985) and Dowling (1982), show that pitch contour is crucial in melody recognition and recall. Dowling's study revealed that a melody pattern is most easily recalled when both contour and interval are the same on replaying, but that recognition still remains when the contour is the same but with different intervals. The study of results in the Sing Song tasks especially, confirms this.

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Format and Content of the Study

The study was carried out at both year 4 and year 8, and involved both singing and keyboard tasks.

Samples of videos of four different one-to-one tasks results were viewed as follows:

Year 4

Task Title	Reference Number	Group	No. of tapes viewed	% of total sample
Sing Song	MUS/1/48/O/1996	A	100	20%
Keyboard	MUS/3/48/O/1996	A	98	20%
Vocal Sizzle*	MUS/17/48/O/1996	C	47	10%
Keyboard Rhythms*	MUS/27/4/O/1996	B	45	10%

Total viewed   290

Year 8

Task Title	Reference Number	Group	No. of tapes viewed	% of total sample
Sing Song	MUS/1/48/O/1996	A	85	20%
Keyboard	MUS/3/48/O/1996	A	43	10%
Keyboard Patterns*	MUS/8/48/O/1996	B	44	10%
Vocal Sizzle*	MUS/17/48/O/1996	C	41	10%

Total viewed   213

The tasks marked * are link tasks, and it is accepted that these will not be identified in any reports or articles arising from this study.

The original NEMP marking was somewhat broad, such as "mostly or fully in tune", "mostly or fully in rhythm" or "not attempted" (Sing Song); or in the case of Keyboard Patterns (Year 8) as "success throughout" or "some success". With such broad categories, boundaries between them were also broad, as well as to some degree subjective. More importantly for this study, it was not the concern of the NEMP markers to determine what musical factors resulted in a child being marked as having "some success" rather than "success throughout" in a task other than that it was not quite right. It is to identify some of these musical factors, to identify in what way a task performance is wrong, that is the concern of this study.

Data from each task area in the main part of this study is presented in the following format:

Year 4
Description
Table(s)
Column graph(s)
Comments

Year 8
Description
Table(s)
Column graph(s)
Comments

Comparisons and conclusions

Note: On occasions the performance of a child would be interrupted in the course of a task, or in some way disturbed; or the teacher would abort the exercise. In one case the video went blank. This sort of aberration accounts for the discrepancies in numbers in some of the tasks.

<u>Sing Song - 1/48/O</u>   Group A

<u>Pitch and Rhythm patterns, Sing Song 1/48/O,   Year 4</u>

Description:

In Sing Song, a pitch pattern is present when one of the following is met:

- The pitch of the melody is sung accurately
- It is at a wrong tessitura (flat or sharp)
- Some notes are wrong while a recognisable contour is present. Examples of this are -
    (1) the melodic contour is contracted, i.e. lower notes are sharpened and higher notes flattened
    (2) mispitched note(s) put out subsequent pitch accuracy
    (3) individual notes are mispitched
    (4) difficulties with the rhythm or words lead to a loss of concentration on pitch, usually in the latter part of the melody
    (5) the tune is improvised, or part-improvised but nevertheless has a musical melodic contour.

Rhythm pattern is present when one of the following is met:

- The rhythm is sung accurately
- It is generally correct, but with some inaccuracy
- It is wrong, but there is a consistent pattern, as, for example in task 5 where a (wrong) rhythm pattern in bar 1 is repeated in bar 2.
- A rhythm is improvised. This occured in a number of cases where the child had difficulty reading the words, so just made something up.

Table 1 - Sing Song 1/48/O   Year 4   Patterns   n = 100

	Didn't try	Pitch Pattern	No pitch pattern	Rhythm pattern	No Rhythm pattern
Task 1	12	59	29	76	12
Task 2	12	63	25	77	11
Task 3	12	42	46	61	27
Task 4	17	23	60	47	36
Task 5	15	19	66	64	21
Task 6	17	61	22	73	10
Task 7	18	28	54	68	24

Sing Song 1/48/0 Year 4 Patterns
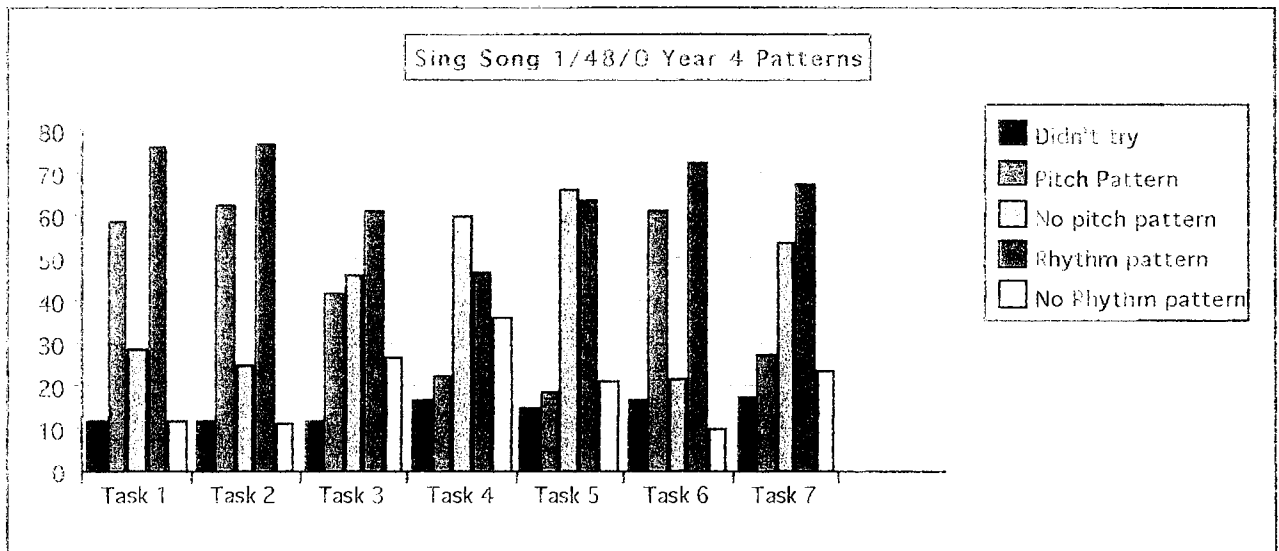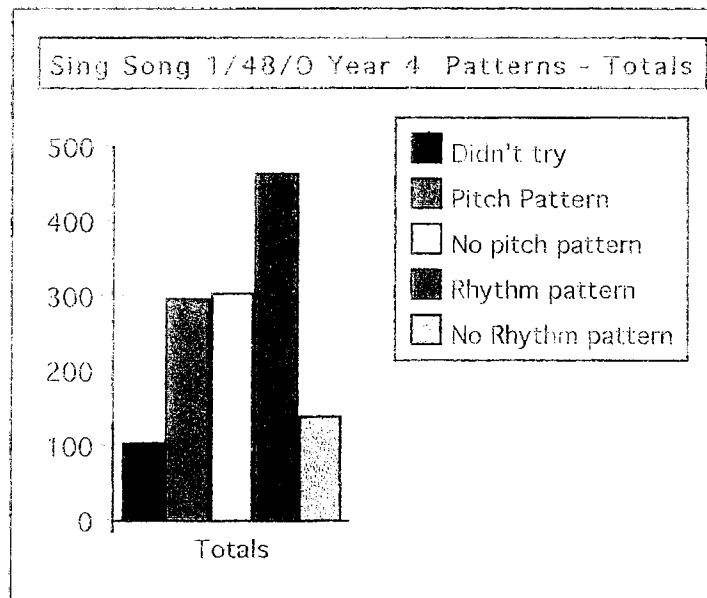
Table 2 - Sing Song 1/48/O   Year 4   Patterns   Totals   n = 100

	Didn't try	Pitch Pattern	No pitch pattern	Rhythm pattern	No Rhythm pattern
Total	102	295	302	466	141

Sing Song 1/48/0 Year 4 Patterns - Totals

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Comments:

The purpose of the Sing Song tasks was to discover whether or not the child could sing in tune and/or in rhythm. Those who did not succeed in either of these according to the criteria set by NEMP nevertheless in many cases demonstrated that they had a sense of pitch and/or rhythmic patterning.
The most striking feature is the strong presence of both pitch and rhythmic patterns in all seven tasks, with the emphasis on rhythmic patterning.

Comparison of Pitch Pattern and Rhythm Pattern percentages with NEMP percentages - Year 4
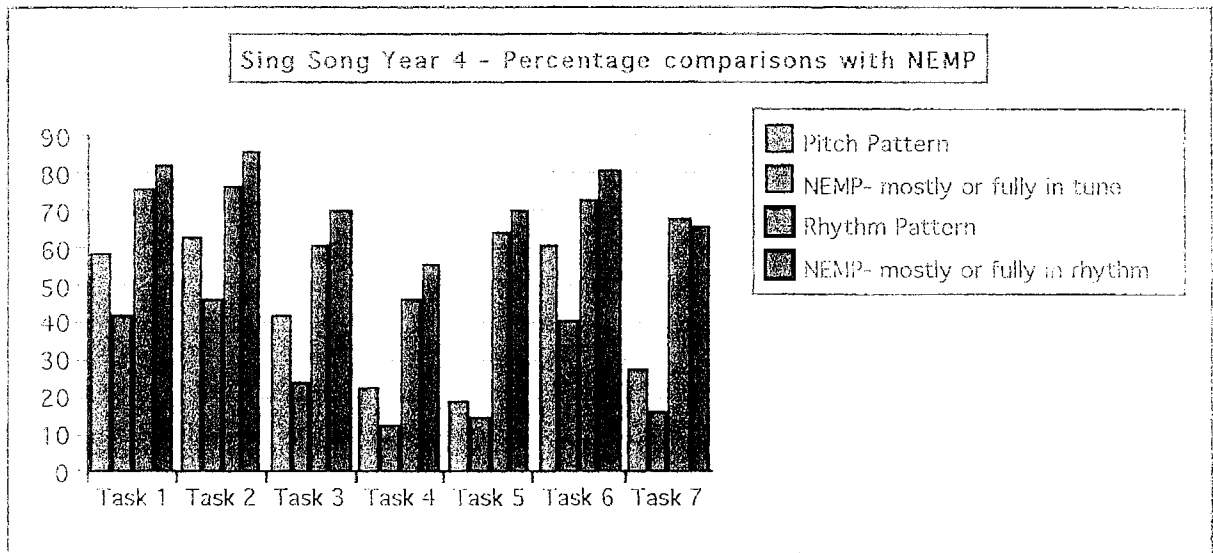
Description:

The proportions of success and failure in the individual tasks are similar to those revealed in the NEMP Report (20)[1] in which the outcomes are given simply as "mostly or fully in tune", "mostly or fully in rhythm" or "not attempted".
By translating the above data into percentages of "n", and putting these against percentages extracted from the NEMP results categories, a comparison can be made of data obtained in this study with regard to pitch and rhythm patterning, and the "mostly or fully in tune" and "mostly or fully in rhythm" categories of the NEMP results. Data of this comparison is given in Table 3 below.

Table 3 - Sing Song 1/48/O   Year 4   Comparison of Pitch Pattern and Rhythm Pattern percentages with NEMP percentages

	Pitch Pattern	NEMP- mostly or fully in tune	Rhythm Pattern	NEMP- mostly or fully in rhythm
Task 1	59	42	76	82
Task 2	63	46	77	86
Task 3	42	24	61	70
Task 4	23	13	47	56
Task 5	19	15	64	70
Task 6	61	41	73	81
Task 7	28	16	68	66

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[1] Numbers in brackets after "NEMP Report" refer to the appropriate page number in *MusicAssessment Results 1996*

Sing Song Year 4 – Percentage comparisons with NEMP

Legend:
- Pitch Pattern
- NEMP- mostly or fully in tune
- Rhythm Pattern
- NEMP- mostly or fully in rhythm

Comment:

It would appear that children are more adept at singing pitch patterns than at singing in tune (or mostly in tune). The situation is slightly reversed, however, with respect to singing in rhythm (or mostly in rhythm). It could be assumed that those who scored in the NEMP assessment, but who did not sing rhythm patterns must have been in the NEMP "mostly" category, though there is no break-down of data to allow for firm evidence of this. This table should be compared with that for the year 8 sample, Table 7.
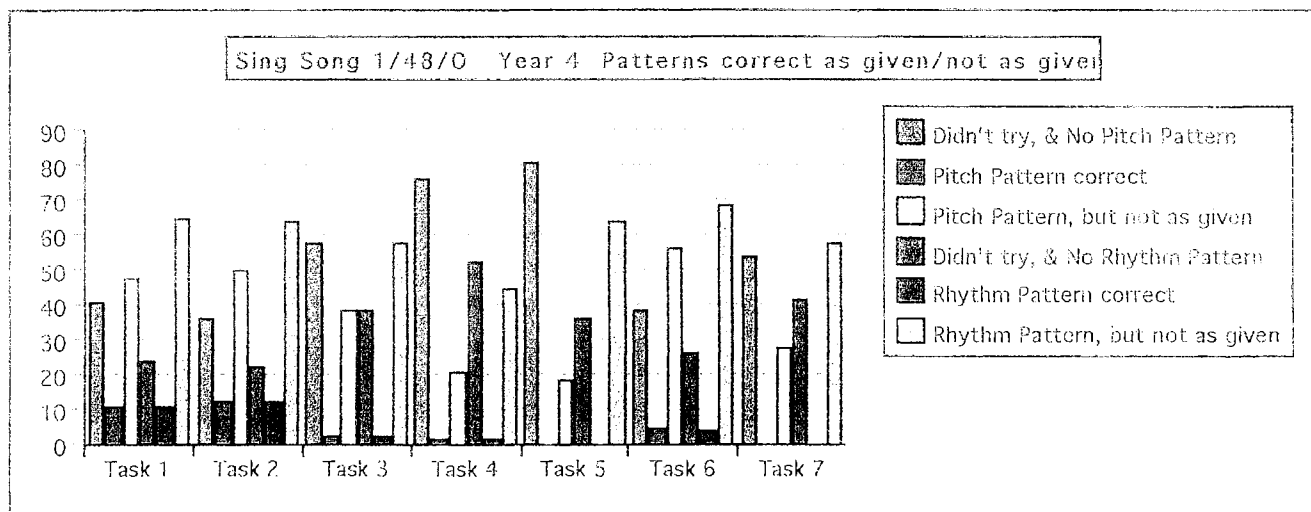
Patterns as given/not as given, Sing Song 1/48/O, Year 4

Description:

It would also be assumed that some children who did not sing "mostly or fully in tune" or "mostly or fully in rhythm" might nevertheless have sung pitch and/or rhythm patterns that were not the correct ones. Table 4 has refined the broad categories of Pitch Pattern and Rhythm Pattern given in Table 1 to show the numbers of those who sang the patterns as in the set tasks, and those who sang patterns, but which were different from those set.

Table 4 - Sing Song 1/48/O   Year 4   Patterns as given/not as given   n = 100

	Didn't try, & No Pitch Pattern	Pitch Pattern correct	Pitch Pattern, but not as given	Didn't try, & No Rhythm Pattern	Rhythm Pattern correct	Rhythm Pattern, but not as given
Task 1	41	11	48	24	11	65
Task 2	37	13	50	23	13	64
Task 3	58	3	39	39	3	58
Task 4	77	2	21	53	2	45
Task 5	81	0	19	36	0	64
Task 6	39	5	56	27	4	69
Task 7	54	0	28	42	0	58

Sing Song 1/48/0 Year 4 Patterns correct as given/not as given

Legend:
- Didn't try, & No Pitch Pattern
- Pitch Pattern correct
- Pitch Pattern, but not as given
- Didn't try, & No Rhythm Pattern
- Rhythm Pattern correct
- Rhythm Pattern, but not as given

Comment:

Table 4 shows clearly that a large proportion of the children who sang pitch and/or rhythm patterns did not sing the patterns that were set in the tasks, but rather patterns either of their own inventions, but more commonly that they perceived as generated by the accompanying words. The issue of the effect of the words is discussed in the Supplementary section of this study. A similar breakdown of pitch and rhythm patterns into "as given" and "not as given" is given for Year 8 Sing Song in Tables 8 and 9, and for Year 8 Keyboard Patterns in Table 18.

Pitch and Rhythm patterns, Sing Song 1/48/O, Year 8

Description:

Tables 5, 6, 7 and 8 which give the patterning data for year 8, are based on the same criteria as for the year 4 data.

[DSI]Table 5 - Sing Song 1/48/O   Year 8   Patterns   n = 85

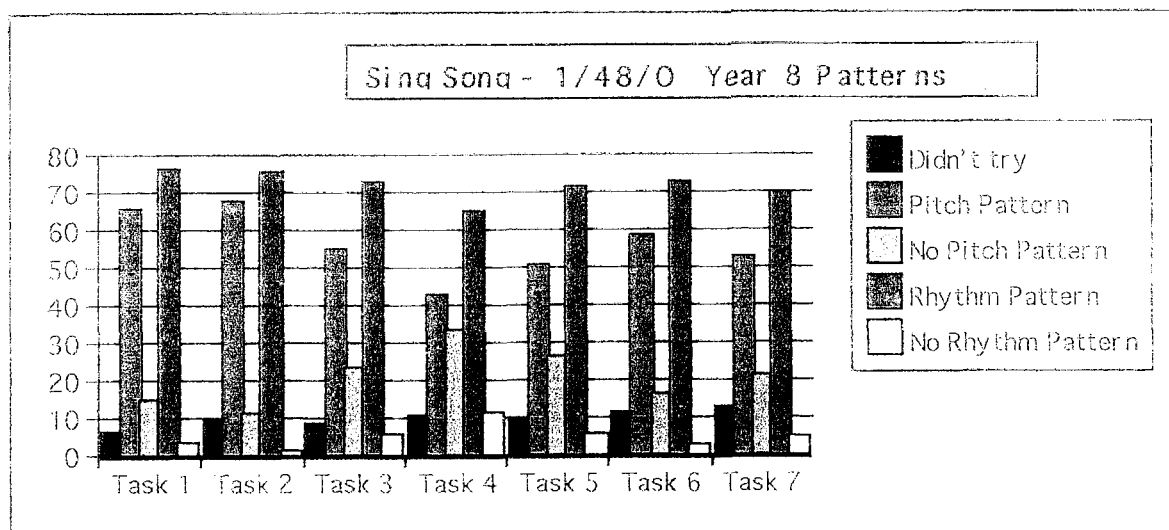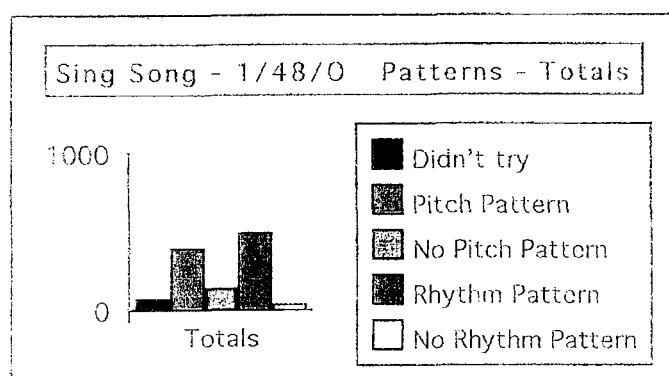|	Didn't try	Pitch Pattern	No Pitch Pattern	Rhythm Pattern	No Rhythm Pattern
Task 1	6	65	14	76	3
Task 2	9	67	11	75	1
Task 3	8	54	23	72	5
Task 4	10	42	33	64	11
Task 5	9	50	26	71	5
Task 6	11	58	16	72	2
Task 7	12	52	21	69	4

Sing Song - 1/48/0 Year 8 Patterns

Table 6 - Sing Song 1/48/O   Year 8   Patterns   Totals   n = 85

	Didn't try	Pitch Pattern	No Pitch Pattern	Rhythm Pattern	No Rhythm Pattern
Total	65	388	144	499	31

Sing Song - 1/48/0 Patterns - Totals

Comments:

A smaller number of "didn't try" is apparent in all tasks than was the case with year 4, and again "Rhythm pattern" was distictly superior to "Pitch pattern".
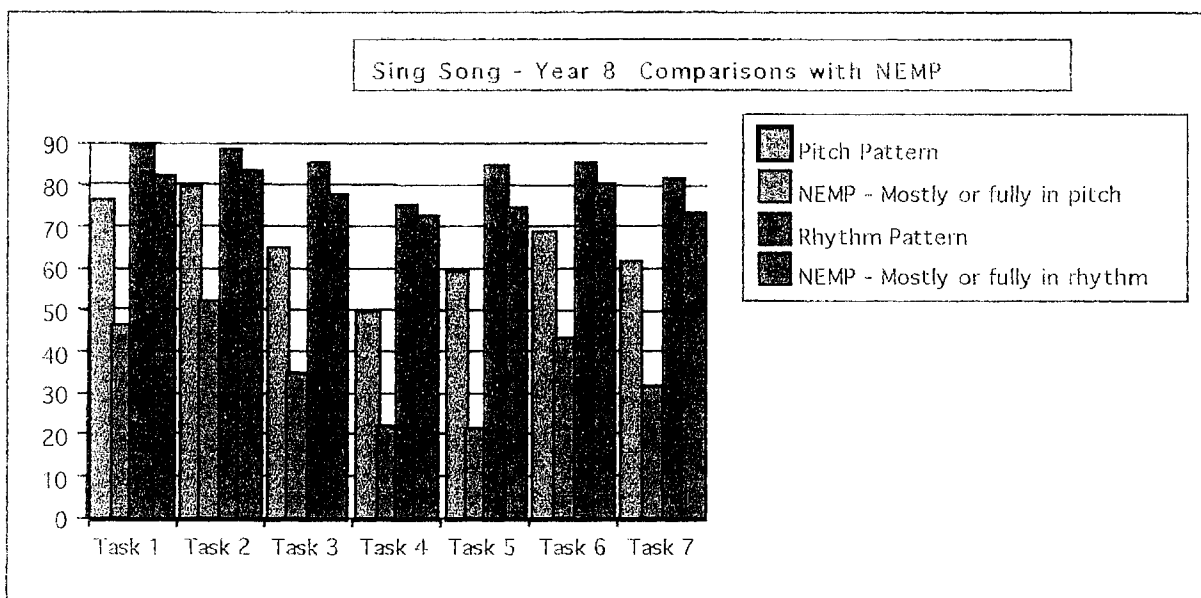
Comparison of Pitch Pattern and Rhythm Pattern percentages with NEMP percentages, Year 8

Description:

The basis of Table 7 is the same as that of the equivalent comparison of year 4 data in Table 3.

Table 7 - Sing Song 1/48/O   Year 8   Comparison of Pitch Pattern and
Rhythm   Pattern percentages with NEMP percentages   n = 85

	Pitch Pattern	NEMP - Mostly or fully in tune	Rhythm Pattern	NEMP - Mostly or fully in rhythm
Task 1	76	46	89	82
Task 2	79	52	88	83
Task 3	64	34	85	77
Task 4	49	22	75	72
Task 5	59	21	84	74
Task 6	68	43	85	80
Task 7	61	31	81	73

Sing Song - Year 8 Comparisons with NEMP

Pitch Pattern
NEMP - Mostly or fully in pitch
Rhythm Pattern
NEMP - Mostly or fully in rhythm

Comments:

It is interesting that, compared with the year 4 sample, Table 3, in year 8 the difference between the more "difficult tasks 3, 4 and 5 is less apparent. Also, the performance with respect to rhythm patterns is now superior to the NEMP "Mostly or fully in rhythm" category. Pitch patterns results are even more strikingly better that the NEMP "Mostly or fully in pitch" category.

Patterns correct as given/not as given, Sing Song 1/48/O Year 8

Description:

Table 8 is constructed on the same basis as the equivalent Table 4 for year 4. To give a broader picture, the totals for year 8 are also given in Table 9.

Table 8 - Sing Song 1/48/O   Year 8   Patterns correct as given/not as given   n = 85

	Didn't try	Pitch pattern as given	Pitch pattern, but not as given	No pitch pattern	Rhythm pattern as given	Rhythm pattern, but not as given
Task 1	6	44	21	14	35	41
Task 2	9	51	16	11	43	32
Task 3	8	10	44	23	8	64
Task 4	10	4	38	33	4	60
Task 5	9	2	48	26	2	69
Task 6	11	18	40	16	18	54
Task 7	12	19	33	21	19	50

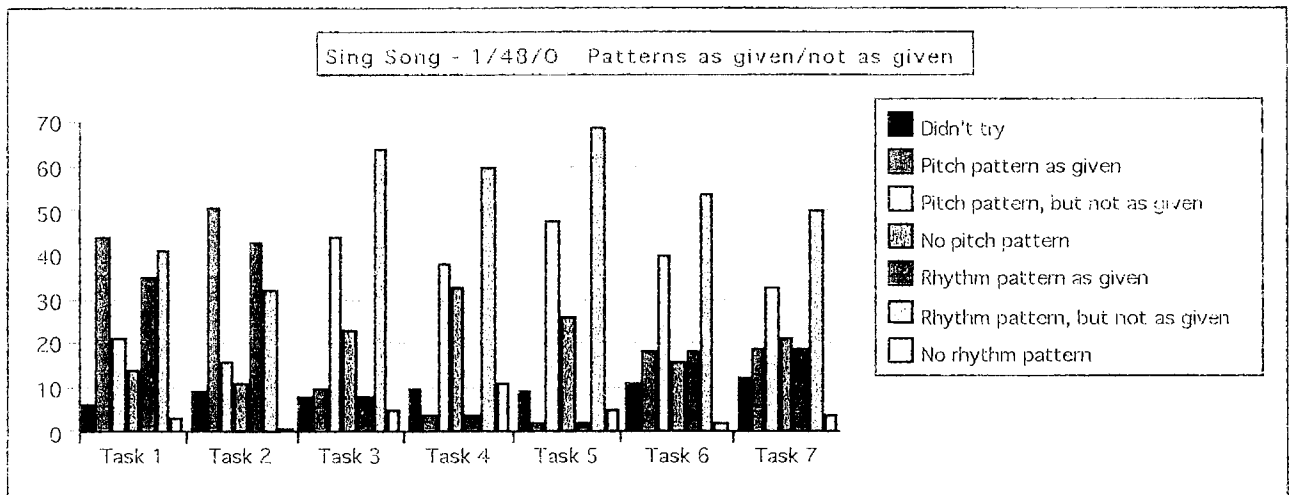Sing Song - 1/48/O   Patterns as given/not as given

Table 9 - Sing Song 1/48/O Year 8 Patterns correct as given/not as given - totals   n = 85

	Didn't try	Pitch pattern as given	Pitch pattern, but not as given	No pitch pattern	Rhythm pattern as given	Rhythm pattern, but not as given	No rhythm pattern
Total	65	148	240	144	129	370	31

Sing Song - 1/48/O Year 8 Patterns as given/not as given - totals

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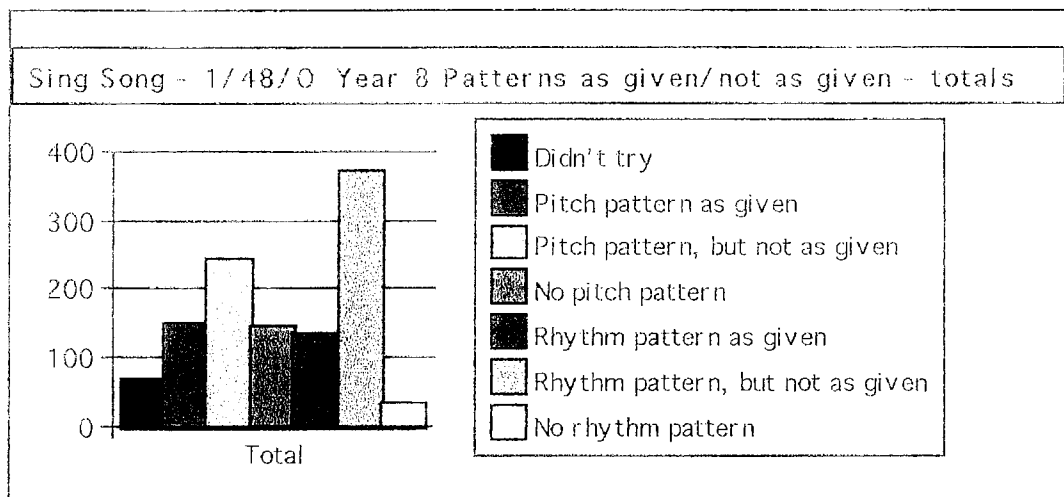
Comments:

It is interesting to observe that numbers of pitch and rhythm patterns as given were mostly the same. Possibly accuracy in the one generates accuracy in the other or, to put it negatively, a mistake in the one generates a mistake in the other. This is borne out by the fact that it was nearly always the same children who were accurate in both. The same feature was observed in Keyboard Rhythm Year 4, both Imitation and Improvisation tasks, Tables 15, 16 and 17, Keyboard Patterns Year 8, both Imitation and Improvisation tasks, Tables 18 and 19, Vocal Sizzle Year 4, Tables 20 and 21, and Vocal Sizzle Year 8, Table 22.

The superior performance in rhythm patterning is obvious, this being nearly double those who demonstrated ability in pitch patterning.

Tasks 3, 4 and 5 in particular presented great difficulties to both year 4 and year 8 children.

Task 4 is particularly interesting because each of bars 1, 2 and 3 has the same pitch pattern; yet only four year 8 children got it right, and the number who failed to get any pitch pattern was the highest of any of the tasks. Rhythm-wise, all notes except the last were of equal duration, yet this task scored highest in the "No rhythm pattern" category. The degree of problem with the words is one likely explanation (See Supplement, Tables 24 & 25).

Because of the "mostly or fully" categorising in the NEMP results, it is not possible to compare these with the NEMP results.
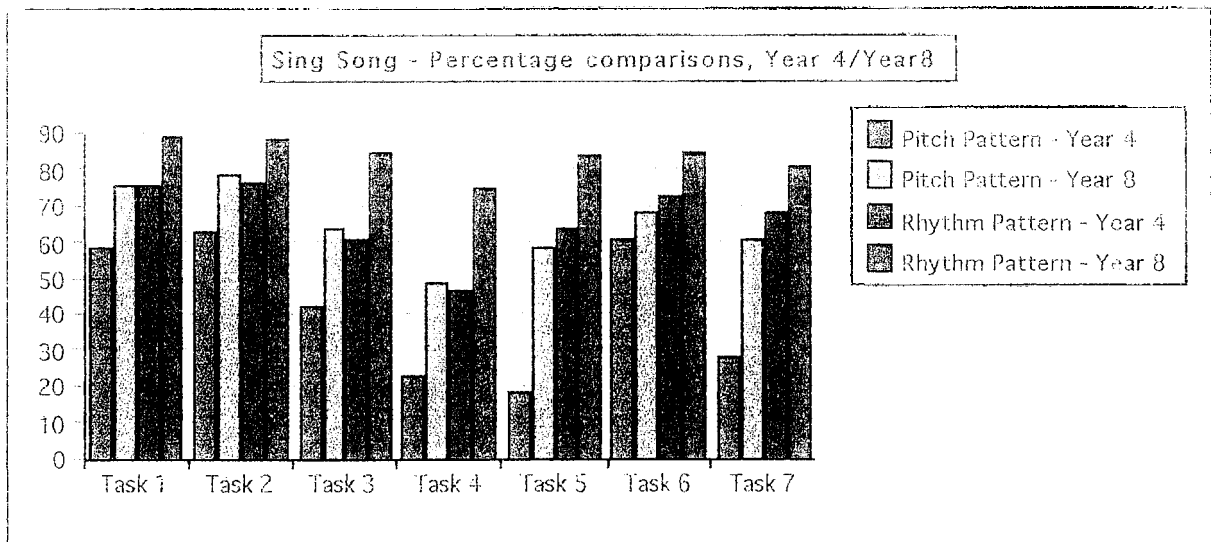
Comparisons of Sing Song 1/48/O results, Year 4/Year 8

Description:

The Sing Song tasks administered to year 4 and year 8 were identical. The pitch and rhythm patterns respectively are based on tables 1 and 5 above; that is, both patterns as given, and patterns, but not as given are included each category.

Table 10 - Sing Song 1/48/O   Year 4 & Year 8   Percentage comparisons of results in Rhythm Pattern and Pitch Pattern

	Pitch Pattern - Year 4	Pitch Pattern - Year 8	Rhythm Pattern - Year 4	Rhythm Pattern - Year 8
Task 1	59	76	76	89
Task 2	63	79	77	88
Task 3	42	64	61	85
Task 4	23	49	47	75
Task 5	19	59	64	84
Task 6	61	68	73	85
Task 7	28	61	68	81

Sing Song - Percentage comparisons, Year 4/Year8

Legend:
- Pitch Pattern - Year 4
- Pitch Pattern - Year 8
- Rhythm Pattern - Year 4
- Rhythm Pattern - Year 8

Comments:

One would expect that, as with the NEMP results, year 8 results would be superior to those of year 4. This was indeed the case. The "difficult" tunes 3, 4, 5 and 7, however, show a proportionately more striking improvement at year 8.

Description:

Only the sight reading exercises apply to this focus. Useful information was obtained from the earlier tasks, however, and are used in another focus of this project.

In Keyboard, a pitch pattern is present when one of the following is met:

- The pitch of the melody is played accurately
- Some notes are wrong while a recognisable contour is present. Examples of this are-
    (1) mispitched note(s) put out subsequent pitch accuracy
    (2) individual notes are mispitched
    (3) the tune is improvised, or part-improvised but nevertheless has a musical melodic contour.

Rhythm pattern is present when one of the following is met:

- The rhythm is played accurately
- It is generally correct, but with some inaccuracy
- It is wrong, but there is a consistent pattern, as, for example in exercise 1 where a (wrong) rhythm pattern in bars 1 and 2 is repeated in bars 3 and 4.
- A rhythm is improvised.

Sightreading patterns, Keyboard 3/48/O, Year 4

Table 11 - Keyboard 3/48/O   Year 4   Sightreading patterns   n = 102

	No attempt	Pitch Pattern	Rhythm Pattern
Sightreading 1	52	31	17
Sightreading 2	67	20	14
Sightreading 3	82	9	8
Sightreading 4	91	6	6
Own tune	50	40	43

Keyboard - 3/48/O Year 4 Sightreading patterns

■ No attempt
▦ Pitch Pattern
▦ Rhythm Pattern
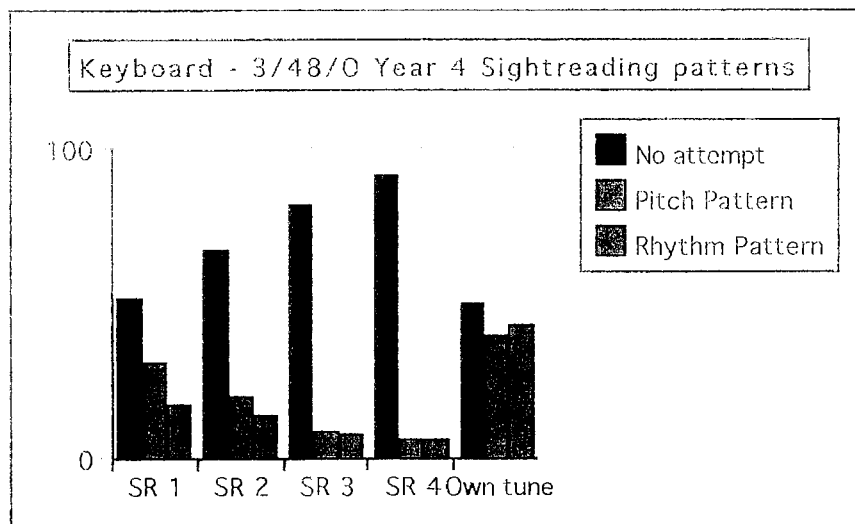
Table 12 - Keyboard 3/48/O   Year 4   Sightreading patterns   Totals

	No attempt	Pitch Pattern	Rhythm Pattern
Total	342	106	88

Keyboard 3/48/O Year 4 Sightreading - Totals
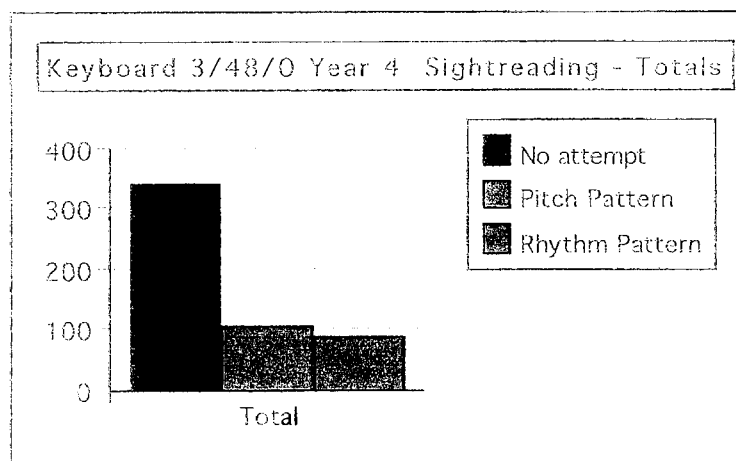
Comments:

It was clear that most children had had no previous experience in playing the keyboard. Consequently, there were many problems with this set of tasks, some of them quite unrelated to what the tasks aimed to find out. The number who didn't attempt the tasks is a clear indication of these problems. The issue of the validity of data obtained for the NEMP results is outside the scope of this study, however, and some useful information was forthcoming from the videos.

The sharp increase in "No attempt" as the tasks progressed could be interpreted as a progressive reduction in confidence on the part of the children doing the tasks. Indeed, the videos revealed that many of the children were distincly unhappy as they struggled with tasks that were beyond them, a discomfort that was shared by the teachers as they encouraged them to try. That the children were told that they didn't have to do these tasks obviously contributed to the number of No attempts.

Sightreading Patterns, Keyboard 3/48/O Year 8

Description:

The data was extracted from the year 8 samples on the same basis as for year 4.

Table 13 - Keyboard 3/48/O   Sightreading patterns   Year 8   n = 43

	No attempt	Pitch pattern	Rhythm Pattern
Sightreading 1	24	17	9
Sightreading 2	29	14	10
Sightreading 3	39	4	2
Sightreading 4	39	4	4
Own Choice	28	14	13

Keyboard - 3/48/0, Sightreading Year 8 Patterns
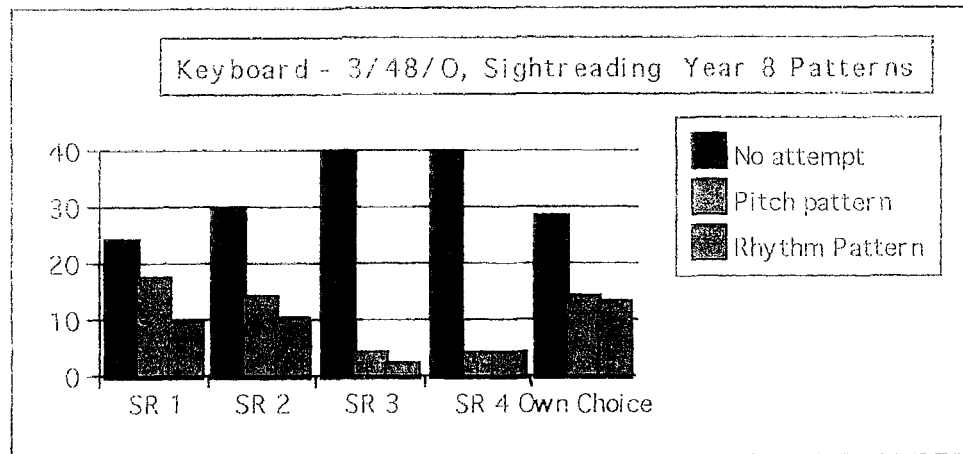
Table 14 - Keyboard 3/48/O   Year 8   Sightreading patterns   Totals

	No attempt	Pitch pattern	Rhythm Pattern
Totals	159	53	38

Keyboard 3/48/0 Sightreading - Totals
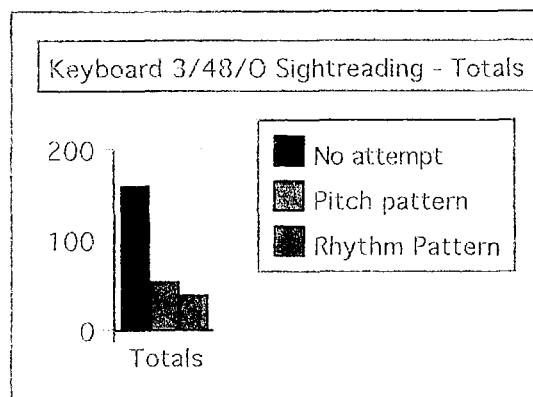
Comments:

That these tasks were beyond most children is, as in the year 4 results, evident from the numbers of "No attempt." For children unfamiliar with the keyboard, it was possible to make visual links between pitch upness and downness in a musical score and lateral direction on the keyboard. The nature of durational music notation has little or no meaning to those who are unfamiliar with it, however. Consequently, results in rhythm pattern were inferior to those in pitch pattern - with the one exception. This was the last task in which the child was invited to play anything on the keyboard. Whether through "Fur Elise" or "Chopsticks", more children were able to demonstrate that they had some feel for musical pattern than through an unfamiliar piece in an unfamiliar notation.

Pattern imitation, Keyboard Rhythms 27/4/O Year 4

Description:

Keyboard Rhythms was for Year 4 children only, and tested two aspects of rhythm patterning;

1. To imitate a repeated rhythmic pattern that was played to the child.
2. To improvise a rhythmic pattern against a played ostinato.

Because different pitch notes were used, it was possible to identify pitch patterns as well as rhythm patterns in the childrens' performances. The NEMP Report marked the four imitation tasks as "success throughout" or "some success". The concern of this study was with whether or not there was a pattern, and not with the accuracy or not of the imitation of the given pattern. The results are different from those of the NEMP results, and cannot be fairly compared.

In the imitation tasks of Keyboard Rhythms, a pitch pattern is present when one of the following is met:

- The pitch is imitated accurately at least twice accurately
- A pitch pattern, but not necessarily the correct one, is played at least twice.

Rhythm pattern is present when one of the following is met:

- The rhythm is imitated accurately
- A rhythm pattern, but not necessarily the correct one, is played at least twice.

No account is taken as to whether or not the imitated rhythm is in phase with the video, though this is the subject of another part of the sudy.

Table 15 - Keyboard Rhythms 27/4/O   Year 4   Imitation

	Pitch pattern correct	Pitch pattern partly correct	No pitch pattern	Rhythm pattern correct	Rhythm pattern partly correct	No rhythm pattern
Task 1	37	9	0	37	9	0
Task 2	34	2	1	34	3	1
Task 3	34	7	1	34	9	1
Task 4	36	4	1	36	4	1

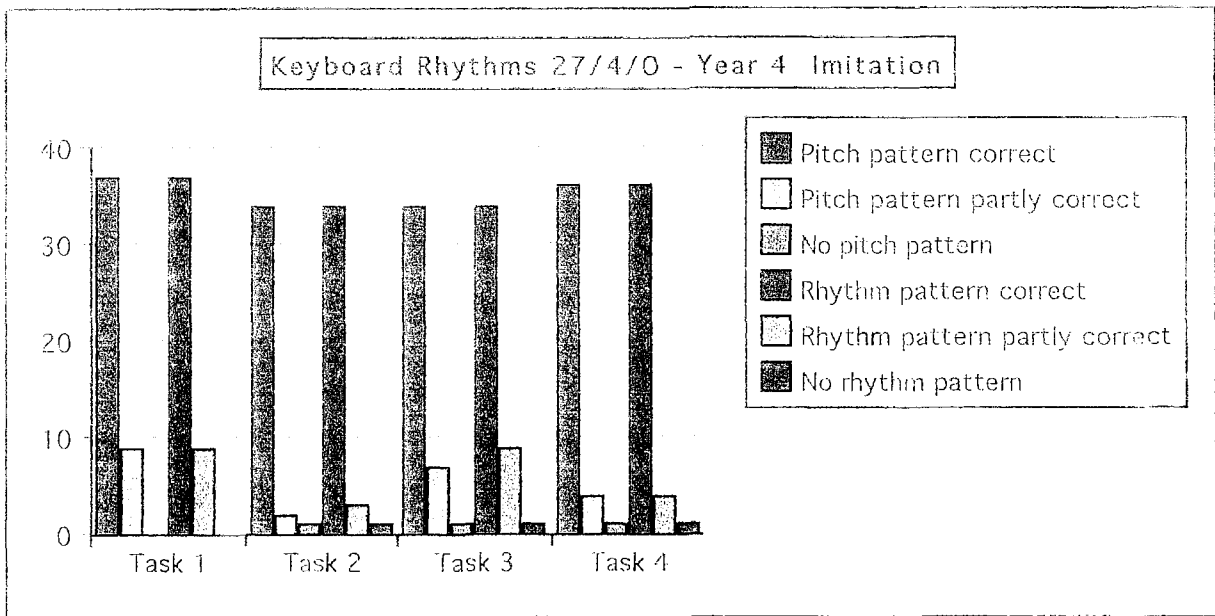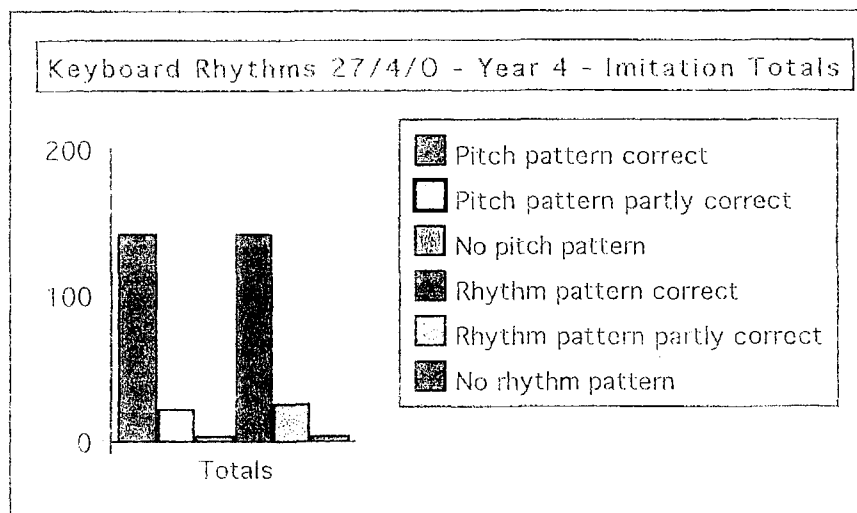Keyboard Rhythms 27/4/0 - Year 4 Imitation

Table 16 - Keyboard Rhythms 27/4/O   Year 4   Imitation   Totals

	Pitch pattern correct	Pitch pattern partly correct	No pitch pattern	Rhythm pattern correct	Rhythm pattern partly correct	No rhythm pattern
Totals	141	22	3	141	25	3

Keyboard Rhythms 27/4/O - Year 4 - Imitation Totals

Comments:

It was notable that pitch and rhythm patterns coincided in nearly all cases. Admitedly, the pitch patterns involved only one or two notes, but they were present and consistent.

Some pitch and rhythm pattern is present in all the task 1 performances, and nearly all of the others. The children were instructed to "Make a simple pattern - it doesn't have to be a tune." They were required to use only a few marked notes. It was clear that they understood the meaning of "pattern" and readily played it.

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This task scored generally low in the NEMP project, so the high scores in the present study, with its more liberal criteria, are all the more interesting.

Improvised task, Keyboard Rhythms 27/4/O, Year 4

Description:

In the improvised task of Keyboard Rhythms, a pitch pattern is present when the same pitch pattern is recognisable in at least two consecutive playings. A rhythm pattern is present when the same rhythm pattern is recognisable in at least two consecutive playings. The Practice, although not part of the task, is included as an indication that learning took place as the children gained even a minimal experience with a keyboard.

Table 17 - Keyboard Rhythms 27/4/O   Year 4   Improvised task

	Didn't try	Pitch pattern	Rhythm pattern	No pattern
Practice	4	19	19	22
Task	7	36	36	2

Keyboard Rhythms 27/4/O - Year 4 Improvised task
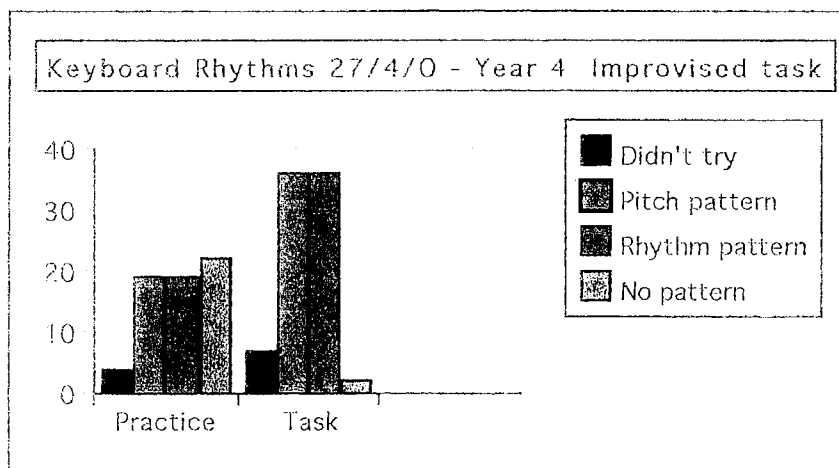
Comments:

The improvised task, with the practice that preceded it revealed a ready pitch and rhythm patterning, though the practice often failed to bring the two repetitions pattern that was the criterion set in this study. In most cases, however, the benefit of the practice led to a positive result in the task itself.

Pitch and Rhythm patterns, Keyboard Patterns 8/48/O Year 8

Description:

Keyboard Patterns was for Year 8 children only. As its name suggests, Keyboard Patterns was concerned with the imitation of a repeated pattern that was played to the child, and with the improvising of a rhythm pattern against a simple rhythmic ostinato. Its intentions were similar to those of Keyboard Rhythms at year 4, but at a more advanced level.

Imitation

As with the Year 4 Rhythm Patterns, the NEMP Report marked the two tasks as "success throughout" or "some success". This study was concerned only with the presence of a pitch and/or rhythm pattern.

In the imitation tasks of Keyboard Patterns, a pitch pattern is present when one of the following is met:

- The pitch is imitated accurately at least twice
- A pitch pattern, but not necessarily the correct one, is played at least twice.

Rhythm pattern is present when one of the following is met:

- The rhythm is imitated accurately
- A rhythm pattern, but not necessarily the correct one, is played at least twice.

No account is taken as to whether or not the imitated rhythm is in phase with the video, though this is the subject of another part of the study.

Table 18 - Keyboard Patterns 8/48/O - Imitation   n = 44

	No pattern	Correct pitch pattern	Pitch pattern, but not the right one	Correct rhythm pattern	Rhythm pattern, but not the right one
Task 1	0	44	0	44	0
Task 2	6	33	5	32	6

Keyboard Patterns 8/48/0 Year 8 Imitation

Legend:
- No pattern
- Correct pitch pattern
- Pitch pattern, but not right one
- Correct rhythm pattern
- Rhythm pattern, but not right one
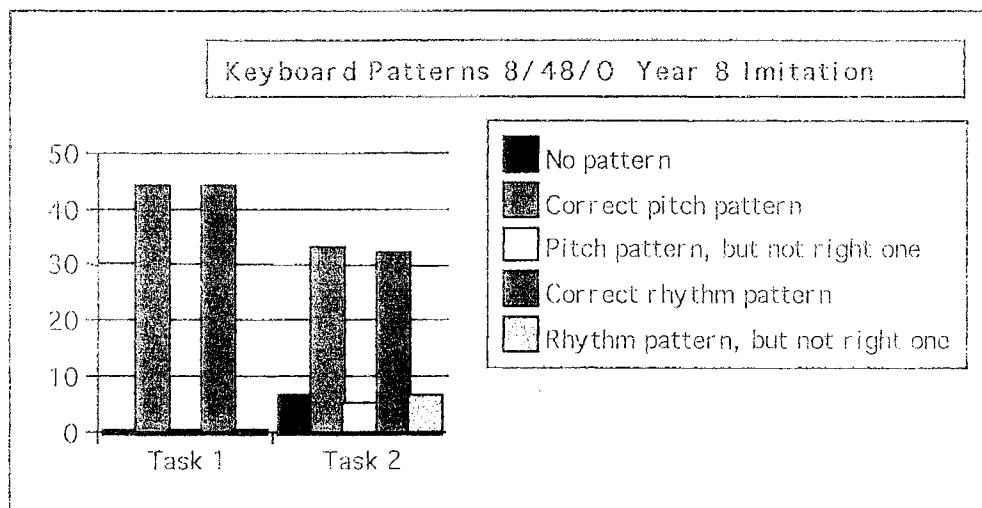
Comments:

As with Keyboard Rhythms at Year 4, the results would appear to indicate very high success with this task, probably because the nature of the task focused the child's attention on repeated musical patterns rather than on the details of individual notes.

Improvisation, Keyboard Patterns 8/48/O Year 8

Description:

As with Keyboard Rhythms at Year 4, this part of the task involved the child's first working out a musical pattern (on the four marked notes) and then playing their own pattern while the ostinato tune is played on the video. The criterion for a pattern was that a pitch or rhythm pattern respectively should be recognisable at least twice consecutively. The results revealed that in no case was a rhythm pattern present without a recognisable pitch pattern, so the tables below are presented differently from those in the Year 4 Keyboard Rhythms.

Table 19 - Keyboard Patterns 8/48/O - Improvisation

	Didn't try	Pattern worked out in practice	No repeated pattern	Pitch pattern in task	Rhythm pattern in task
Practice	3	31	10	--	--
Task	3	--	6	31	32

Keyboard Patterns - 8/48/0 Year 8 Improvisation

- ■ Didn't try
- ▨ Pattern worked out in practice
- ☐ No repeated pattern
- ▨ Pitch pattern in task
- ▓ Rhythm pattern in task
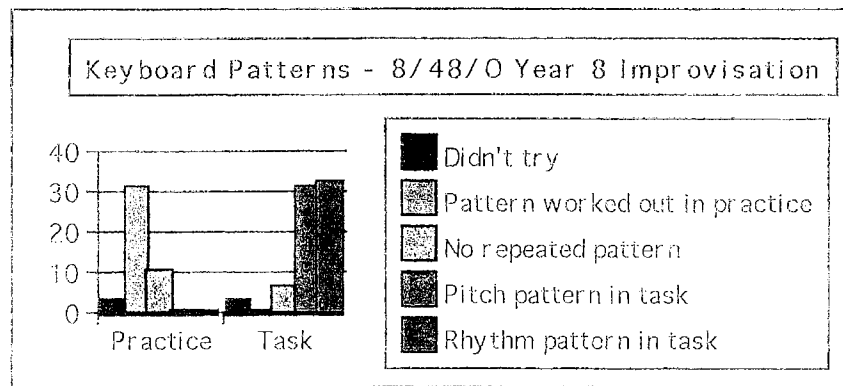
Comments:

The data from the videos differentiated between pitch and rhythm in the "No repeated pattern" category. But it was found that with only one exception, those who produced a pitch pattern also produced a rhythm pattern, indicating that the gestalt perception of musical patterning was well established.

Sometimes it would take a little time for a pattern to become established in the task performance, and as in the task the "tune" was played just four times, one got the sense that had it gone through a few more repetitions, the child's pattern would have become more consolidated.

Vocal Sizzle 17/48/O   Group C

Pitch and Rhythm patterns, Vocal Sizzle 17/48/O Year 4

Description:

The purpose of this task was for the child to imitate vocally a wordless tune heard on the video. This was marked simply as in tune (or not). However, again there were opportunities to listen for musical patterning in the children's performances. The criterion of "in tune" was therefore ignored, and "Pitch pattern" was marked as positive when the contour was present, even in those cases when it was recited or semi-spoken. Similarly, "Rhythm pattern" was marked as positive when a durational pattern was evident.

Table 20 - Vocal Sizzle 17/48/O   Year 4   n = 47

	Not attempted	Pitch pattern	No pitch pattern	Rhythm pattern	No rhythm pattern
Task 1	2	44	1	45	0
Task 2	3	41	1	44	0
Task 3	3	41	3	42	2
Task 4	2	44	1	45	0
Task 5	2	44	1	44	0
Task 6	4	42	1	43	0

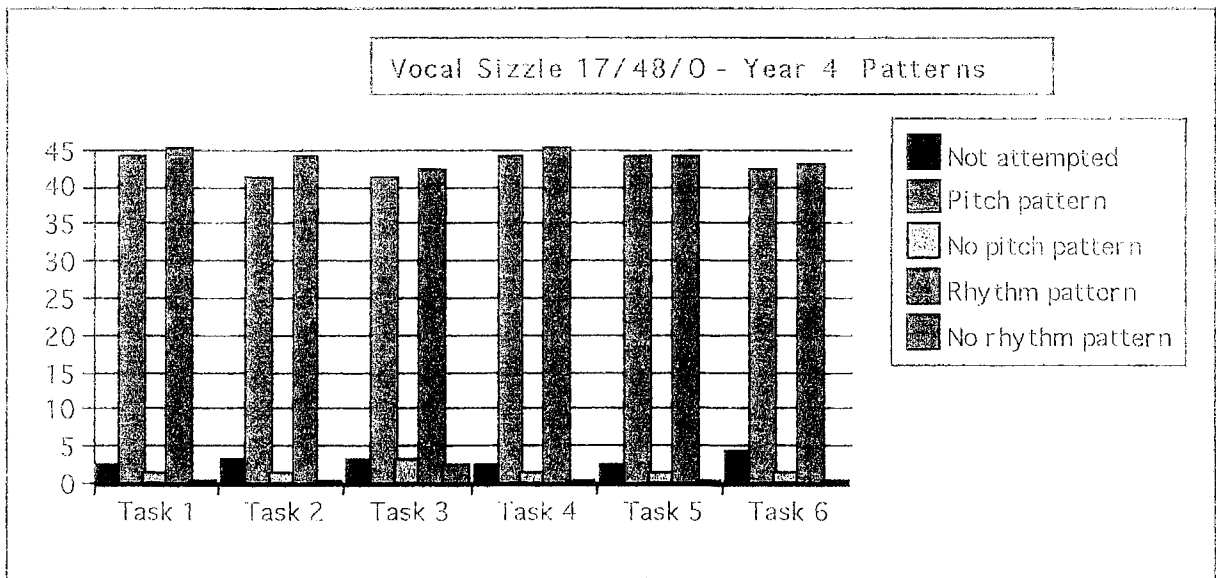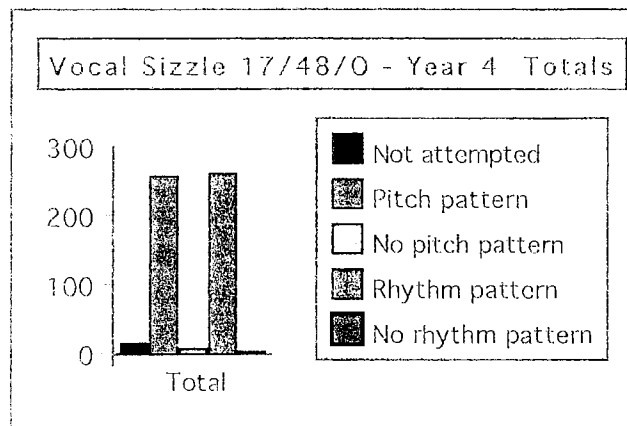Vocal Sizzle 17/48/0 - Year 4 Patterns

Table 21 - Vocal Sizzle 17/48/O Totals   Year 4   n = 47

	Not attempted	Pitch pattern	No pitch pattern	Rhythm pattern	No rhythm pattern
Totals	16	256	8	263	2

Vocal Sizzle 17/48/0 - Year 4 Totals

Comments:

The very high positive results reflect the criteria applied to this task. A high proportion of children, having attempted singing, as instructed, in the earlier tasks, soon degenerated into a a form of recitative or spoken song, as they were affected by discomfort or embarrassment. However, even when recited, and well out of tune, they clearly demonstrated patterned pitch inflexions as well as rhythm patterns.

Table 22 - Vocal Sizzle 17/48/O   Year 8   n = 41

	Not attempted	Pitch Pattern	No Pitch Pattern	Rhythm Pattern	No Rhythm Pattern
Tune 1	0	38	3	38	3
Tune 2	1	40	0	39	1
Tune 3	2	39	0	39	0
Tune 4	1	40	0	40	0
Tune 5	1	40	0	40	0
Tune 6	1	40	0	40	0
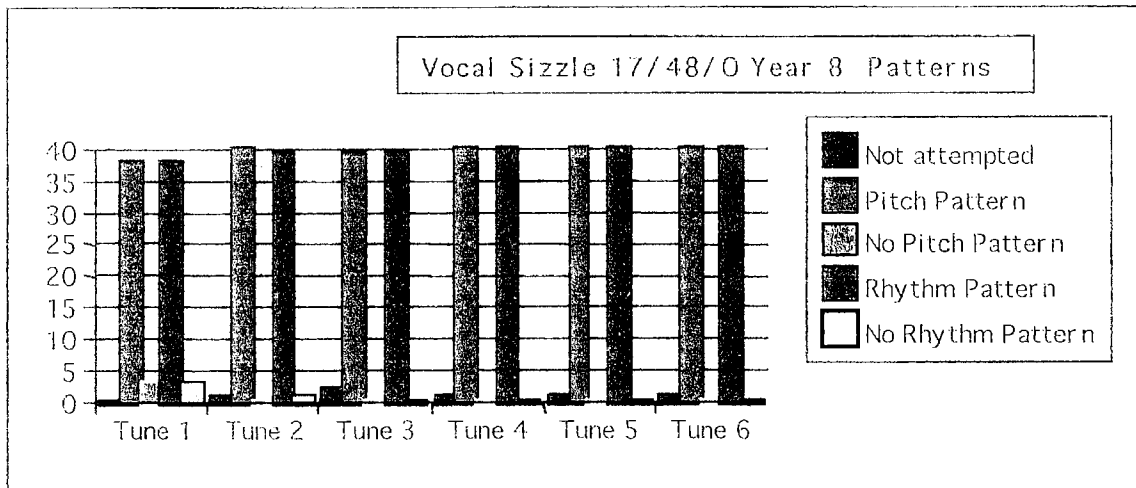
Comments:

The criteria applied to the year 8 were the same as for year 8, and a similar high presence of pitch and rhythm patterns is present.
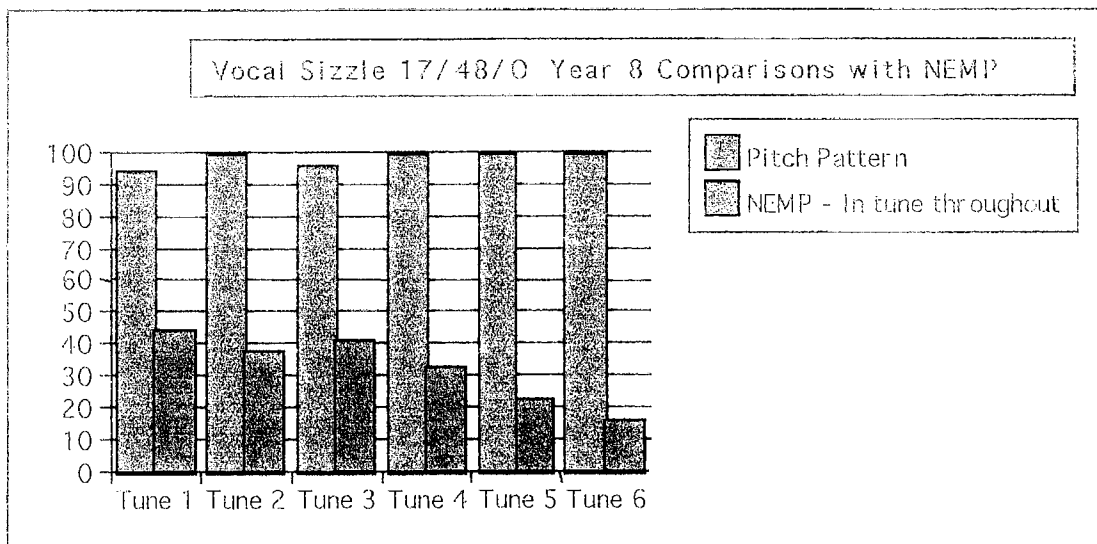
Comparison of Pitch Pattern and Rhythm Pattern percentages with NEMP percentages, Vocal Sizzle 17/48/O Year 8

Decsription:

Because of the high positive result in this task at both year 4 and year 8, it was considered interesting to relate the percentage results at year 8 to the "in tune" percentages found in the NEMP project

Table 23 - Comparison of Pitch Pattern and Rhythm Pattern percentages with NEMP percentages - Year 8

	Pitch Pattern - %	NEMP - in tune throughout - %
Tune 1	93	43
Tune 2	98	37
Tune 3	95	40
Tune 4	98	32
Tune 5	98	22
Tune 6	98	15

Vocal Sizzle 17/48/0 Year 8 Comparisons with NEMP

Legend:
- Pitch Pattern
- NEMP - In tune throughout

X-axis: Tune 1, Tune 2, Tune 3, Tune 4, Tune 5, Tune 6
Y-axis: 0 to 100

Comments:

The NEMP results show that at both years 4 and 8 considerably fewer than half the children tested could sing the tasks "In tune throughout". Yet most, and in some tasks all were able to sing, speak or recite accurately the pitch contour of the tunes. Table 23 shows that the most striking difference is in Task 6 in which a mere 15% sang in tune throughout, while all performances indicated the presence of a pitch contour. One can only conclude that they could hear the pitch patterns and reproduce these, even if in a rudimentary way, with their voices. The issue of intonation and accuracy is a different one, however, and is addressed more fully in another focus of this study.

Rhythm patterns showed the same, almost 100% positive result.

Supplementary Studies

The main focus of this study was pitch and rhythm patterning. However, three particular aspects of peripheral information are relevant and worthy of reporting.

1. The effect of words in Sing Song 1/48/O

Description:

In viewing the videos of Sing Song 1/48/O, it soon became apparent that the words of some of the tasks presented considerable difficulties, sometimes to the extent that it became no more than a labourious reading exercise. This factor was therefore noted in the data, and shows in Tables 24 (year 4) and 25 (Year 8).

Table 24 - Sing Song 1/48/O   Year 4 Words interference with pattern   n = 100
("Didn't try" is not included)

	Pitch Pattern	No Pitch Pattern	Rhythm Pattern	No Rhythm Pattern	Words Interfered
Task 1	59	29	76	24	3
Task 2	63	25	77	23	8
Task 3	42	46	61	39	25
Task 4	23	60	47	53	32
Task 5	19	66	64	36	15
Task 6	61	22	73	27	2
Task 7	28	54	58	42	11

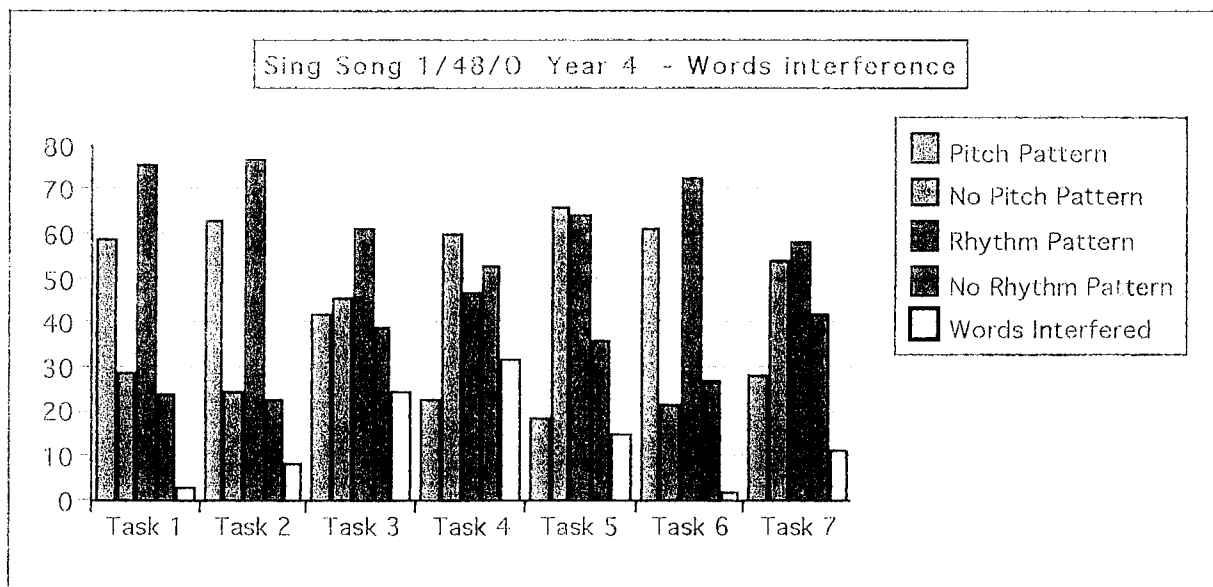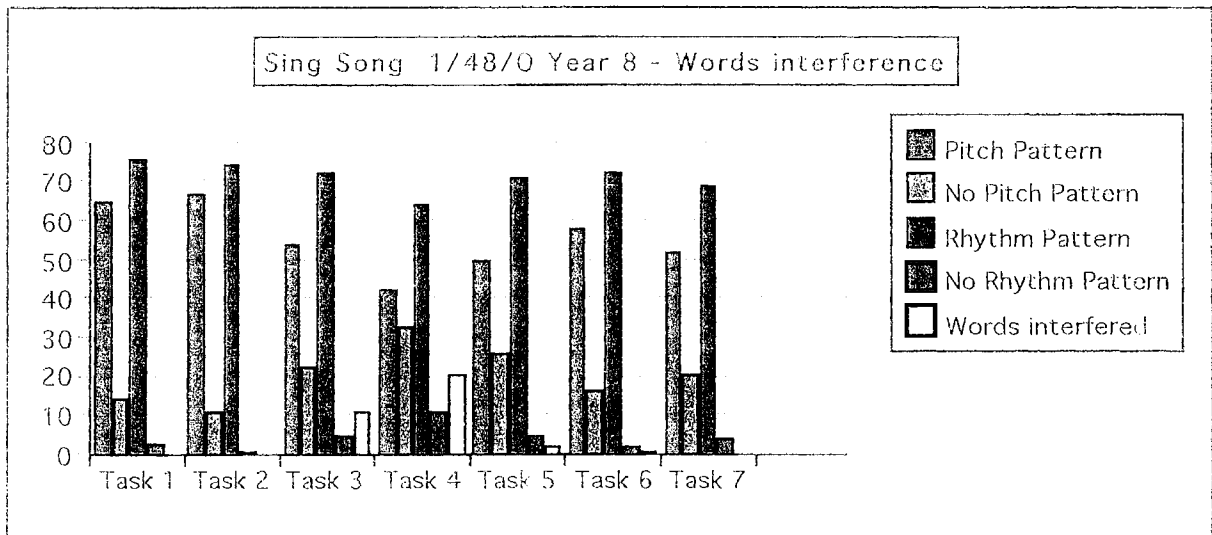Sing Song 1/48/O Year 4 - Words interference

Table 25 - Sing Song 1/48/O   Year 8   Words interference with pattern   n = 100
("Didn't try" is not included)

	Pitch Pattern	No Pitch Pattern	Rhythm Pattern	No Rhythm Pattern	Words interfered
Task 1	65	14	76	3	0
Task 2	67	11	75	1	0
Task 3	54	23	72	5	11
Task 4	42	33	64	11	21
Task 5	50	26	71	5	2
Task 6	58	16	72	2	1
Task 7	52	21	69	4	0

Sing Song 1/48/O Year 8 - Words interference

Pitch Pattern
No Pitch Pattern
Rhythm Pattern
No Rhythm Pattern
Words interfered

Comments:

As can seen in Tables 24 and 25, tasks 3, 4 and 5 posed the biggest difficulty in this respect, especially at year 4. Task 4, with the simplest, even note rhythm, lost its pattern with many children because of their halting reading of, especially the words "Belfast" and "Sligo". However, the words of task 3 are straightforward enough, so difficulty in pronouncing individual words cannot be the full reason. Perhaps the children sought to give a pattern to a phrase that lacked it in the first place, and became muddled in the process. Task 6 was mostly attacked with relish but, as can be seen in tables 4 and 8, patterns, though present, were mostly different from those given.

2. Pitch direction as an aspect of patterning

Description:

Note was kept of the pitch direction in those performances in which pitch patterning was present. In Table 26, "Pitch pattern correct" refers to those where a pattern was clearly present, even if it wasn't fully accurate.

Table 26 - Keyboard 3/48/O   Year 4   Pitch direction   n = 100

	Didn't try, or no success	Pitch pattern correct	Pitch direction correct
Sightreading 1	59	31	30
Sightreading 2	71	20	23
Sightreading 3	88	9	8
Sightreading 4	92	6	3
Own tune	54	40	-
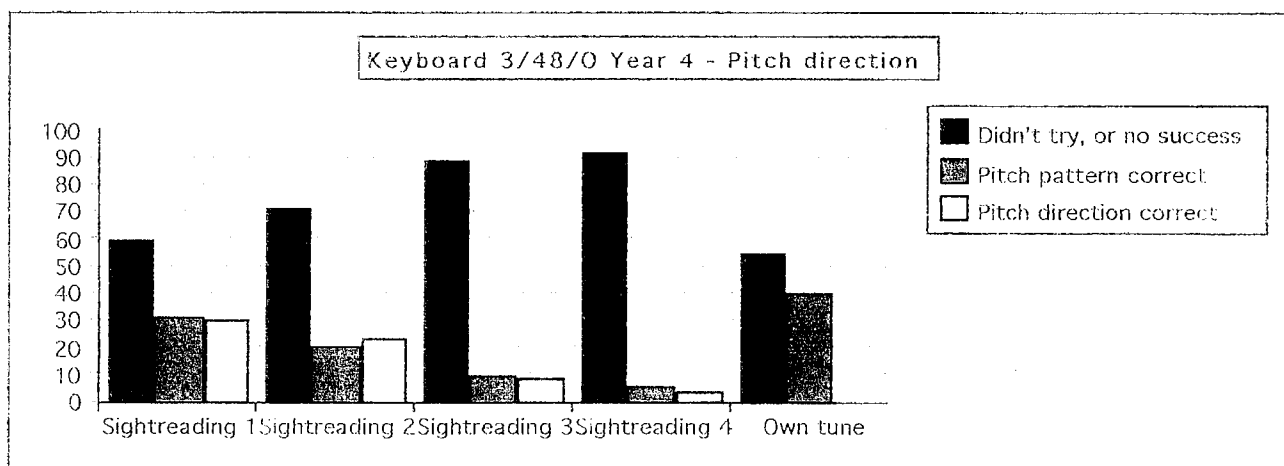
Comments:

There is little significance in this, except, perhaps to suggest that where an accurate sense of the direction of pitch is present, there is also a recognisable pitch pattern. Not reflected in these tables is the fact that in any of the tasks there were never more than two children who got either pitch pattern or pitch direction correct; it was nearly always both.

3. Tempo co-ordination

Description:

In Keyboard Rhythm (Year 4 only) and Keyboard Patterns (Year 8 only), note was taken of the degree to which the children co-ordinated their tempi with the video, whether or not they reproduced the rhythm correctly. The results are in tables 27, 28 and 29

Table 27 - Keyboard Rhythm 27/4/O   Year 4   Tempo co-ordination   n = 45

	Didn't try	Rhythm & tempo wrong	Rhythm & tempo correct	Tempo mostly correct	Tempo slower	Tempo faster	Tempo erratic
Tune 1	1	2	7	2	13	17	4
Tune 2	1	4	9	2	6	19	5
Tune 3	0	8	6	2	7	21	1
Tune 4	0	6	3	0	4	29	3

Keyboard Rhythm 27/4/O   Year 4 - Tempo co-ordination

- Didn't try
- Rhythm & tempo wrong
- Rhythm & tempo correct
- Tempo mostly correct
- Tempo slower
- Tempo faster
- Tempo erratic
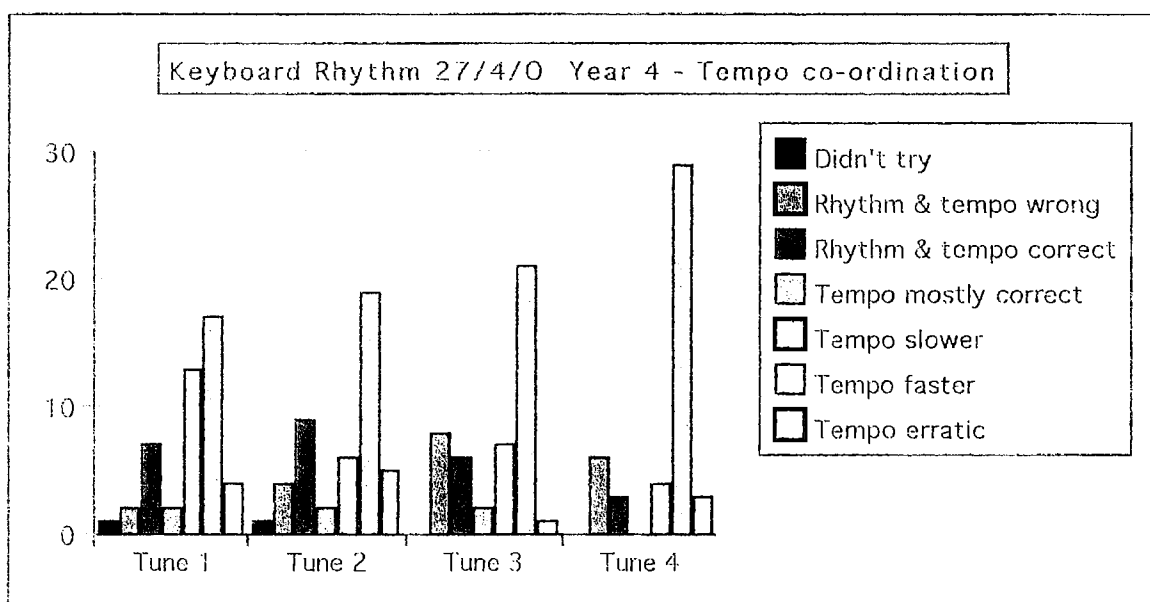
	Tempo co-ordinates	Tempo doesn't co-ordinate	Didn't try
Improvised task	2	41	2

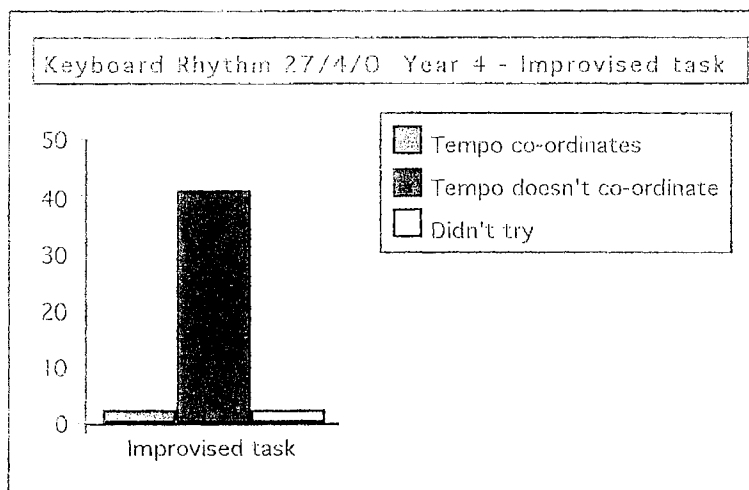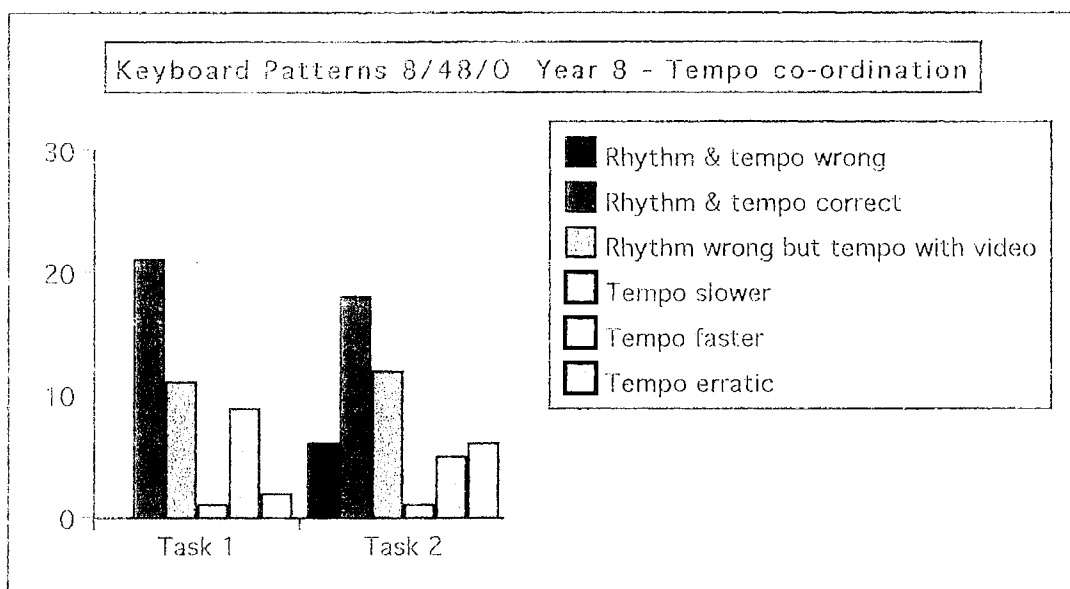Keyboard Rhythm 27/4/O Year 4 - Improvised task

Table 29 - Keyboard Patterns 8/48/O   Year 8   Tempo co-ordination   n = 44

	Rhythm & tempo wrong	Rhythm & tempo correct	Rhythm wrong but tempo with video	Tempo slower	Tempo faster	Tempo erratic
Task 1	0	21	11	1	9	2
Task 2	6	18	12	1	5	6

Keyboard Patterns 8/48/O Year 8 - Tempo co-ordination

Comments:

The most striking feature here is the difference between year 4 and year 8. Although the tasks were different, the demands of tempo co-ordination were similar. To get a true picture of tempo accuracy it is necessary to add in the year 8 table the two tempo correct categories, ie., "Rhythm and tempo correct" and "Rhythm wrong but tempo

with video". For other reasons, the categories in the Year 4 tasks are different. It can be seen that a high proportion of Year 8 children were able to keep an accurate pulse tempo. The proportion of Year 4 children who can keep an accurate pulse tempo, even if we add the "Tempo mostly correct" to the correct category, is much lower.

Of both Year 4 and Year 8 children who failed to keep the correct tempo, the large majority played faster than the tempo on the video. It is most noticable that in Year 4 Keyboard Rhythms, where the four tasks allow one to observe a trend as the tasks become more difficult, more children played faster as the task became harder.

General Comparisons and Conclusions:

There is a strong consistency in all tasks to indicate that children at both years 4 and 8 hear, are aware of, and are more inclined to sing and play music in some form of patterning. Furthermore, in certain tasks, particularly in Keyboard Rhythms (Tables 15, 16 and 17), Keyboard Patterns (Tables 18 and 19) and Vocal Sizzle (Tables 20, 21, 22 and 23), the pitch and rhythm patterns coincided in nearly all cases. The listening experiences of children in a world of constant exposure to music are concerned with meaningful and integrated musical units, as in songs, and the phrases that make them up. When these are broken up into their raw components of, particularly pitch and duration (rhythm), along with texture and timbre, they can often fall outside the children's experience of what music is, so that, for example, a pitch pattern without its accompanying rhythm pattern becomes musically meaningless. A note in isolation, even when followed by another note in isolation, has little or no meaning. The same two notes in a meaningful context, however, become a single and more memorable musical unit in its own right. It was noticed that most children, when invited in Keyboard 3/48/O to explore the keyboard before starting the tasks, did so in patterns - playing scales up and down, playing the highest note followed by the lowest, playing rhythmical clusters or "chopsticks"-like patterns. In short, one must ask whether the ability to pitch accurately one note following another is a musical accomplishment. Similarly, one should ask whether the ability to sing or play a pattern of successive pitches or rhythms may not be the more truly musical accomplishment.

The study highlights the distinction between music learning and music experience. The NEMP project is concerned with "assessing and reporting on the achievement of New Zealand primary school children.."[2]. The tasks are designed accordingly, and it is unlikely that in a subject such as music, that permeates the lives of children, in or out of school, that the project presumes to restrict its assessment to the school musical components. Music learning is a highly complex and multifarious process that takes many forms, ranging from developing the intense technical skills required for professional training in performance on an instrument, to the almost purely emotional experiences that are the basis of music therapy. Amongst these is the wide range of media musical experiences and casual musical tinkering that makes up the musical lives of most New Zealanders. To identify the musical factors that are effectively in the realm of normal experience as distinct, if indeed they are distinct,

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[2] *MusicAssessment Results 1996*, National Education Monitoring Report 4, EARU, University of Otago, 1997 p4

from those that are in the realm of music education, particularly in schools, is an almost impossible task.

It may be that the NEMP project has succeeded mostly in teasing out a few aspects of children's musical experience that they would have had regardless of anything that was done in their schools.

Imitating a fragment of tune that contains no musical meaning for the child can be little more than a mechanical process of a kind that the child has either learned to do or not. Some children were clearly able to imbue a musical fragment with meaning. This was often clear from an expression of pleasure that come on to the face of the child. For most, however, the task of playing the right notes on a keyboard instrument with which they were almost totally unfamiliar, or of singing by themselves some notes that had just been sung or played was an arduous job that gave them little pleasure or sense of achievement.

This, together with the difficulty children experienced in coordinating their pattern, tempo and pitch with those of the given model, often led them to simply go their own way. The outcome was, as seen in a number of the results of this study, performances that in themselves were good, but which failed to meet the particular NEMP criteria for success in those tasks.

The data collected in the various focuses of this consultancy open up many possibilities for other research projects. Perhaps some of these can be followed up subsequently. With music coming up as a NEMP subject again in 2000, it may be possible to keep in mind, when devising the tasks, such research spin-offs as this has presented, as well as benefitting from the present studies in refining their choice and design.

References

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