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An independent research evaluation of the impact of the NLO Programme was commissioned from an academic team at the International Music Education Research Centre (iMerc) at the Institute of Education, University of London, led by Professor Graham Welch (Chair of Music Education) and funded through a donation from the JPMorgan Chase Foundation.

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iMerc

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new london orchestra
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Literacy through Music: A research Evaluation of the New London Orchestra's Literacy through Music Programme

Contents

Executive Summary

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- The NLO Programme took place in seven classes from three Primary Schools in the London Borough of Newham across the Spring and Summer Terms of 2011. Overall, 207 children aged six to seven years participated in the Programme.
- Teams of two NLO practitioners (from a core NLO team of two musicians and one performance poet) undertook a weekly programme of music and literacy activities in each of the seven intervention classes for a total of twenty weeks, spread across two school terms (i.e., around six months). The activities were focused on actively engaging these young children in whole class music making, led by the performers, whilst also providing opportunities for the musical activities to lead into language-related development.
- In each intervention classroom, class teachers and teaching assistants also took part and so were able to follow up the NLO activities during the school days between the weekly, musician-led sessions.
- An independent research evaluation of the impact of the NLO Programme was commissioned from an academic team at the International Music Education Research Centre (iMerc) at the Institute of Education, University of London, led by Professor Graham Welch (Chair of Music Education).
- The research included assessments pre-intervention (baseline) (late January) and post-intervention impact assessments mid June (i.e., approximately five months apart). Assessment was through the application of two standardised measures on (i) children's oral language (as this is related to literacy) and (ii) reading. In addition, (iii) the children completed a simple questionnaire survey on their attitudes to music and singing, as well as their sense of social inclusion and positive self-concept. This enabled us to see if there were specific wider benefits outside music and literacy. All the children also had (iv) their singing ability assessed as a simple measure of their musical behaviour and development. Collectively, this package of four impact assessments was also time-based, i.e., being undertaken twice, first at the beginning and then end of the NLO Programme intervention.
- The research evaluation included the gathering of comparative data from

similar aged children in two classes totalling 61 children from a neighbouring school who acted as a non-intervention, control group.

o The results of the research indicate that:

- o There was an average reading-age improvement across the seven NLO Programme classes of 8.4 months. This compares with an average reading age improvement in the two control classes of 1.8 months. The difference in reading age improvement between Programme and control classes is statistically significant.

- o The NLO Programme class improvements in average reading age score ranged from a minimum of 4.8 months to 13.2 months.

- o Children in the NLO Programme classes increased their reading score, on average, by at least their 5-month change in chronological age and, in the majority of Programme classes, by much more.

- o The NLO Programme children also made a significant improvement in their singing ability and sustained their perceived sense of being socially included. The singing improvements were more marked for the children in the NLO Programme classes than for the children in the control classes.

- o The NLO Programme impacts were equally beneficial for children of both sexes.

o The NLO Programme was well received by all participant teachers and their teaching assistants who believed that the Programme had made an important contribution to their own understanding and development.

o A key design feature of the NLO Programme was the teamwork by the teachers, teaching assistants and NLO musicians. The Programme design included explicit, shared literacy goals that were established at the onset and monitored as the Programme progressed, supported by a linked musical activity programme. It can be inferred that this integrated approach was important in fostering the children's progress.

o We can conclude, therefore, that the NLO Literacy through Music Programme was a success in enabling these young participant inner-city children to achieve significantly more in literacy and music compared to similar children outside the Programme. Although the numbers of participants are relatively small (268 children in total, including 61 controls), this is a very positive outcome.

Introduction and Context

The New London Orchestra's *Literacy through Music* programme has been designed to improve children's literacy abilities by engaging them in a special programme of musical activities. Funded by the JPMorgan Chase Foundation, the NLO have been working in a small number of Newham Primary Schools over the past two years as a precursor to rolling out a borough-wide programme in the current academic year (2011-2012).

Following an initial pilot study (2009-2010), the past calendar year (2011) has focused on NLO enacting a twenty-week music programme across two school terms in three Primary schools. A team from the Institute of Education, University of London led by the first author were appointed to (a) work with the musicians and teachers to make explicit the underlying pedagogical and scientific research evidence that could inform the programme's design and (b) undertake an independent evaluation of the impact of the programme on aspects of children's linguistic and musical development.

1.1 Neurobiological evidence: Music and the brain

There has been an increasing interest from the worlds of neuroscience and cognitive psychology into the ways that the human brain processes music. In part, this has stemmed from evidence that music is multiply represented across different parts of the brain, with particular networks of 'modules' undertaking specific aspects of musical processing, such as related to rhythm, melody, notation, imagery and singing (*cf* Tervaniemi, 2009).

Three key strands of this neuroscientific research have a resonance with the current educational programme of the New London Orchestra. These concern studies into: (i) the underlying plasticity of the human brain, i.e., its ability to undergo structural change as a result of experience

(e.g., Shaw & McEachern, 2001); (ii) the possibility of transfer effects from engaging in music (e.g., Kraus & Chandrasekaran, 2010); and, relatedly, (iii) the reported relationships between music and language (e.g., Patel, 2009).

Concerning the first of these, our potential for acquiring new musical behaviours and extending our existing expertise relates to the brain's underlying neuroplasticity. New neural connections are formed in response to experience, such as evidenced by changes in the auditory cortex when learning a musical instrument (Pantev *et al*, 2009). In other research, Hyde *et al* (2009) demonstrated the significance of brain plasticity in a study of instrumental music training with young children aged six years. Structural brain changes were observed after fifteen months experience that diverged from normal development in both motor and auditory areas and which were correlated with behavioural improvements on motor and auditory– musical tests.

Skilled musicians not only develop fine-grained auditory skills, they also demonstrate auditory acuity in other domains, such as speech, language, emotion and auditory processing (Hannon & Trainor, 2007). For example, regression analyses of the relationships between the development of musical skills, phonological processes and early reading ability in two hundred four- and five-year-olds found that

> *'music perception skill predicts reading even after the variance shared with phonemic awareness is removed. This suggests that phonemic awareness and music perception ability tap some of the same basic auditory and/or cognitive skills needed for reading, but that they each also tap unique processing skills'*
> *(Anvari et al, 2002:127).*

With regards to the growing body of research into music and language, a recent review (Patel, 2009) reported evidence from a range of studies to suggest that musicians have superior encoding ability for linguistic sounds. The neurological basis for this advantage is exampled by findings from neuroimaging studies that melodic contour processing in speech and music have overlapping neural substrates, as well as demonstrable overlaps in the syntactic processing of language and music (Koelsch *et al*, 2007).

One implication of this research is that 'the boundary between speech and song can be very fragile' (Deutsch, 2010:37), in the sense that the brain areas governing music and language overlap, such as in relation to singing and speaking. Furthermore, our understanding of either language or music requires the application of rules acquired through experience. The prosodic features of speech are music-like, in that they encompass pitch level, range and contour, loudness variation, rhythm and tempo, and both language and music are governed by a grammar.

Taken as a whole, research indicates that regular engagement with music influences a variety of non-musical brain functions (Patel, 2010).

Tripney *et al* (2010) undertook a systematic review and meta-analysis of twenty-four studies concerning the impact of participation in the arts on the learning, achievement and skills of young people aged 3-16 years. Of these, four studies, involving 128 children aged 3 to 7 years, measured the impact of musical activities on the early literacy development of young children, such as related to phonological awareness, vocabulary and non-sense word fluency. Three studies focused on reading (Gromko, 2005; Register, 2004; Piro & Ortiz, 2009) and one on writing (Standley & Hughes, 1997). Overall, the balance of evidence suggests that 'Participation in structured arts activities improves pre-school and Primary school aged children's early literacy skills' (Tripney *et al*, 2010:20). Furthermore, a recent study of 46 children aged between 6 and 9 years who were having music lessons reports a link between the length of music training and reading comprehension, although no association between length of music training and word decoding skills was evidenced (Corrigall & Trainor, 2011).

The underlying pedagogical approach for such interventions is conceptualised as 'arts integration', where there is perceived to be a transfer of learning from the arts to learning in other areas. This is believed to be a distinctive characteristic of high quality arts interventions. Researchers in Harvard University's *Project Zero*, for example, report that 'high quality arts programs [sic] tend to serve several purposes simultaneously' by engaging learners 'on many different levels and helping them to grow in a variety of ways' (Seidel *et al*, 2009:17). They list seven broad purposes, such as thinking creatively, making connections, developing aesthetic awareness and providing a unique opportunity for self-expression. They also report that quality in arts education, seen through the lens of student learning, is characterized by engagement, purposeful experiences creating and engaging with works of art, emotional openness and honesty, experimentation, exploration and enquiry, and ownership.

There is also a concern to ensure that any distinctive benefits to be derived from arts engagement are available to everyone. For example, the most recent report by the US President's Committee on the Arts and the Humanities (Fiske, 2011) includes reference to Caterall *et al*'s (1999) analysis of the US Department of Education National Educational Longitudinal Survey database (NELS:88) of 25,000 Secondary school students. Caterall *et al* found that 'students with high levels of arts participation outperform "arts-poor" students on virtually every measure' (Fisk, 2011, pviii). Nevertheless, although students coming from homes with low socio-economic-status (SES) were twice as likely to have low arts involvement, all those who had participated derived equal benefit, irrespective of

their socio-economic status.

This is of particular interest in the context of the current NLO programme, given that Newham is characterized by having a very low employment rate (56.2% in 2008/09) and the second most diverse population in the UK (MacInnes & Kenway, 2009), with 70% of the population classified as non-White and 144 languages recorded as pupils' home languages in the 2008 Newham School Census. Compared to the London average, Newham's pupils attain slightly lower levels in all Key Stage Standard Attainment Tests (SATs) (Newham, 2010).

1.2 Aspects of Literacy

The relation between language and literacy skills is well established (Dickinson 2001; Roth et al., 2002; Snowling, 2004) and shows that by kindergarten age (4-5 years), language skills predict later literacy skills in particular ways. Awareness of sounds, through tests of rhyme and phonological awareness (tasks like "say '*slip*' without the /s/",or "take the last sound off '*train*'") are related to word recognition skills at age 6; while vocabulary knowledge (knowing what words mean and being able to use them appropriately) and grammatical understanding (walk -> walking -> walked) predict reading comprehension. These studies demonstrate that wider language skills, beyond knowing the letters of the alphabet and their related sounds, are necessary in order to read and understand text, and show the importance of encouraging a rich language environment through meaningful conversations.

There has been increasing concern that the spoken language skills of many preschool children from disadvantaged backgrounds are delayed and, in a survey of 240 children who were first assessed at entry to nursery aged 3, Locke and Ginsborg (2003) found that, although their cognitive skills improved after two years in nursery, their language scores remained seriously depressed when they started Primary school.

A number of studies have attempted to enhance children's oral language in the preschool years. Some of these have involved parents, usually mothers (e.g. Peterson, Jesso and McCabe, 1999), while others have worked in preschools and kindergartens. A recent example of a school-based intervention was carried out by Dockrell, Stuart and King (2010), who designed an intervention aimed at improving the oral language of children in nursery classes in socially deprived, multicultural London schools; their sample, like the one in the present study, included large numbers of English language learners. Their Talking Time programme was carried out twice a week in 15-minute sessions over two terms and included a number of activities designed to encourage oral language

through modelling structures, asking open questions and describing activities. They compared this programme with Story Reading, which was also carried out for 15 minutes twice a week, and they also had a non-intervention control school. They found that their Talking Time programme made a significant difference to the vocabulary and comprehension skills of the English language learners, although it did not enable them to catch up with their monolingual English-speaking peers; the Story Reading intervention was less effective. This suggests that, in order to be effective, interventions need to be focussed closely on the skills to be improved so that children have clear models, opportunities for practice and feedback.

There does not seem to be any research showing a direct, causal relationship between music and the improvement of literacy, although there is a growing body of inferential evidence (e.g., Tripney *et al*, 2010; Corrigall & Trainor, 2011). Studies which have attempted to enhance literacy skills through experiences with music have generally worked with children with recognised literacy difficulties, such as dyslexia, rather than with normally developing children.

For the reasons given above, if the NLO project encourages children to develop their language skills, this might have a positive effect on their literacy, in terms of reading comprehension (*cf* Corrigall & Trainor, 2011). If the programme also offers opportunities for reading, requiring word recognition, this literacy skill might also benefit. However, the NLO project was unusual as an intervention project in that it did not directly focus on the skills that it aimed to improve. There was no direct attention to oral language or reading as part of the weekly music sessions, although there were opportunities for these behaviours to surface regularly during the sessions (see Section 3.3 below). The NLO performers encouraged the children to chant, clap, copy and compose rhythms, improvise refrains which use rhymes, alliteration or unusual vocabulary, but there was no formal requirement for the children to read, although reading often was a by-product of the activity (see the detail in Figure 1). Any impact of the NLO project on the participant children's reading might, therefore, be due to four things:

(i)   an indirect effect via improved oral language, encouraged in the NLO sessions;

(ii)   an indirect effect via enhanced classroom work, if the teachers develop the musical input through some literacy activities in the classroom between sessions;

(iii) an enhanced sense of themselves as learners which might generalise from the NLO sessions back to their classroom learning;

(iv)   a halo effect, whereby the children's enjoyment of the sessions leads to an improvement in their learning generally.

It has not been possible to explore all these variables exhaustively in the course of this small-scale study, but they should be borne in mind when interpreting the findings.

Figure 1: New London Orchestra musicians at Gallions Primary School, Newham. The photo illustrates an early session of one of the participating Year 2 (age 6) classes being led by a team of two of the designated team of NLO musicians, Baden Prince Jnr and Zoë Palmer. Written words emerging from the children's interactions with the musicians are being used to prompt further discussion and, incidentally, reading. (The other NLO musician in the overall Programme team was Jake Telford – not working in this particular focus school.)

1.3 Designing the Intervention: Working in Partnership

At the beginning of the project, there was a collective meeting of all the adult participants – teachers, teaching assistants, NLO musicians, NLO education managers – with the IoE research team to review the outcomes of the previous year's initial pilot music programme in one school (who also sent representatives to the meeting) and to initiate a discussion of how best to approach the design and content of the 2011 programme. This included a presentation on aspects of the neurological and psychological research literature (such as reviewed in 1.1 above) on the possible underlying links between music and literacy. The review meeting was followed by a second planning session between the researchers and NLO musicians alone that examined the nature of children's literacy development and the literacy curriculum (presented by one of the research team, Hobsbaum); a third 'review' meeting was held at the mid-point of the NLO intervention at the end of the Spring Term to discuss the Programme's progress.

The aims of the weekly workshops were to use aspects of music – such as rhythm – to develop children's oracy development. The content was designed around four main activities: games, poems, stories and songs. Teachers provided the musicians with their teaching plans for literacy de-

velopment and these generated a focus for the design of the weekly intervention sessions. Teachers participated in their class' activities alongside the children and followed up the Programme content in their own literacy-focused class teaching in-between the weekly NLO sessions. As mentioned above, the NLO performers encouraged the children to chant, clap, copy and compose rhythms, and improvise refrains that used rhymes, alliteration or unusual vocabulary. Linked vocabulary and reading activities arising from the musical content were observed to be led by the teachers and teaching assistants during the sessions.

Methodology

2.1 Research design

The design for the study was a quasi-experimental evaluation of an intervention that lasted two school terms (ten weeks each term), carried out in three schools in the London Borough of Newham (see Section 2.2). The three Intervention schools had already been selected by the NLO before the involvement of the research team, and a control school had been chosen as one which was likely to be willing to collaborate as it had been involved with a previous NLO project. It is acknowledged that, from a research perspective, this was not an ideal design, since ideally three control schools would have been selected to match the intervention schools; however, limits in terms of time and NLO funds precluded this.

In the three Intervention schools, the teams of two musicians from the NLO Programme team worked with all the Year 2 classes; in two schools, there were two Year 2 classes and, in the third, there were three, making a total of seven classes and 207 pupils. The Control school had 61 children in two Year 2 classes. Overall, 268 children participated, aged between 6 years 5 months and 7 years 5 months at the start of the project.

The prime research aim was to evaluate the effectiveness of the NLO Programme intervention in raising the reading and language skills of the pupils involved (see Section 3.1) and, in addition, to note any changes in their musical development (see Section 3,2), such as singing competency (see Section 3.2.1) and attitudes to music (see Section 3.2.2). Opportunities were also taken to observe learning and teaching in the classroom (Section 3.3).

2.2 Introduction to the participating schools

School A is described as a large Primary school with just under 500 pupils aged between 3 and 11 years old. Around a quarter of the pupils were from a White British origin, whilst other pupils came from a wide variety of different backgrounds; the largest groups being of Bangladeshi or Black African heritage. In addition, many pupils came to the country as refugees. Two thirds of the pupils were learning English as an additional language. The proportion of pupils who had learning difficulties and/or disabilities had fallen in recent years and was now only a little above average. The proportion of pupils who joined and left the school part-way through their Primary education was also reducing, although this mobility was reported to be still above average (Ofsted, 2009[1]).

School B was a particularly large Primary school with over 700 pupils aged between 3 and 11 years old. The proportion of pupils from minority ethnic backgrounds was very high. The largest groups of pupils were those from Asian and Asian British backgrounds. A majority of pupils were at the early stages of learning English. The proportion of pupils eligible for free school meals was above average. The percentage of pupils who had special educational needs and/or disabilities was below average. The proportion of pupils who entered and left the school at other than the normal times was very high (Ofsted, 2010).

School C was a larger-than-average Primary school with over 400 pupils aged between 3 and 11 years old. A majority of pupils were of African and Caribbean heritage. The proportion of pupils who spoke English as an additional language was above average. The proportion of pupils with special educational needs and/or disabilities was broadly average (Ofsted, 2010).

School D was a large Primary school with over 500 pupils, aged between 3 and 11 years old. The proportion of pupils who were normally entitled to free school meals was above average. The proportion of pupils from minority ethnic groups and who spoke English as an additional language was much higher than average. The largest groups were those from India, Pakistan, Bangladesh or Africa. The proportion of pupils who had special educational needs and/or disabilities was higher than average. The number of pupils who left or joined the school mid-term was also higher than average (Ofsted, 2010).

Overall, the participants included predominantly children from non-White backgrounds (10% of the children were White, 51% were

[1] Details of the case schools are presented to provide background information for the research. The names of schools, teachers and pupils have been replaced in the report so as to ensure anonymity. However, individuals in close working relationships with the case schools may recognise them through description.

Asian/Asian British and 28% Black/Black British). Additionally, 69% were learners of English as an Additional Language (EAL) and 17% having some form of Special Educational Need (n.b., all demographic characteristics are drawn from official DFE data provided by the schools). The characteristics of the children are shown in Table 1 below.

Table 1:   Key demographic characteristics of the children in the NLO Intervention and Control schools

	Intervention Group	Control Group
Gender - boys	117 (56%)	33 (54%)
EAL learners	134 (65%)	50 (82%)
White British	25 (12%)	4 (6%)
Asian	98 (47%)	39 (64%)
Black/Black British	60 (29%)	16 (26%)
Other	24 (12%)	2 (3%)

2.3 Research tools

2.3.1 Oral Language

As literacy is related to oral language, it seemed appropriate to include a test of narrative skills and so the Bus Story (Renfrew, 1997) was chosen for this purpose. In this test, children are shown a book of pictures while the tester tells them a short story about a naughty bus, which accompanies the pictures. The test is standardised for children aged 3½ to 8 years. The child is then asked to retell the story, and their retelling is recorded and transcribed. The children's versions were recorded on a digital recorder for subsequent transcription. Individual testing took approximately 3 minutes per child. Four scores were derived: an Information score, relating to the number of items correctly recalled; the average of the five longest utterances (A5LS), the total number of words and the mean utterance length (MLU). Guidance on scoring for information and utterance boundaries is given in the manual, and an example of a scored transcript is included in Appendix 5.

2.3.2 Reading

The New Group Reading test (NGRT, NFER, 2010) is a recently standardised reading test for use with children aged 6 – 17; Tests NGRT 2A and 2B are parallel versions, covering School Years 2 – 4 (6 – 10 year olds), and were used in this study. Each test contains 48 items; the first part, Sentence Completion, comprises 20 items, each consisting of a sentence with a blank to be filled by selecting one word from a list of five alternatives; the child has only to mark the correct missing word, they do not have to write it. In the second part, Passage Comprehension, three short passages are presented; each one is followed by 9 or 10 multiple-choice items; in order to select the correct answer, the child must have read and understood the passage sufficiently well to be able to locate the information required. The test is untimed; it was administered to whole classes in a single sitting, and took approximately 45 to 50 minutes to complete. Test 2A was administered at the start of the intervention (January, 2011) and test 2B at the end of the intervention (July, 2011).

Children with notable special needs who were perceived to be unable to complete these tests were withdrawn at the discretion of the teacher, although they all participated in the music programme.

2.3.3 Assessment of Singing Competency

In order to assess several aspects of children's singing and associated vocal behaviour, the singing assessment included:

(i)   a measure of the habitual speech centre - by asking each pupil to count backwards from ten and noting the pitch;

(ii)   a measure of comfortable singing range – by asking each pupil to imitate fragments of songs at various pitches, transposed upwards and downwards;

(iii)   a measure of the singing behaviour of two well-known songs – by asking each pupil to sing 'Twinkle, Twinkle' and 'Happy Birthday', or an alternative song that the pupil knew well.

Each pupil completed a researcher-led singing assessment at the beginning of the intervention, and at the end of the Summer term (July, 2011). An example of the singing assessment tool is given as Appendix 2, drawn from the evaluation of 10,000+ children as part of an evaluation of the UK Government's National Singing Programme (Welch et al, 2010).

2.3.4 Pupil Questionnaire: Attitudes to singing, Sense of self efficacy and social inclusion

Each pupil completed a set of 30 survey questions. These questions explored the pupil's attitudes to singing at school and elsewhere, as well as their self-concept and sense of social inclusion and identity as learners. Using a seven point Likert scale, the pupils drew circles around 'smiley' faces to indicate the extent to which they agreed that the statement was true of them (see Appendix 1). Pupils completed this task working in the classroom setting, with the support of their class teacher and learning assistants where necessary.

2.3.5 Observations

Opportunity was also taken to undertake systematic observation of sample NLO Programme sessions in each of the two phases of the Programme. The observations used specially designed protocols adapted from previous research by the team (Saunders et al, 2010) – see Section 3.3.

2.4 Research schedule

The research was carried out between January and July 2011 (see Table 2). The NLO musicians started working with the schools in mid-January and all pre-tests were carried out by early February. The musicians worked in each class for one hour per week until July 2011; post-NLO intervention tests were carried out during late June and early July, 2011.

Table 2:   Research schedule for Literacy through music programme

Research Design		2011						
		January	February	March	April	May	June	July
Intervention	Weekly 1 hour workshops	■	■	■	■	■	■	■
Research Tool	NGRT 2	■					■	
	Bus Story (pre test)	■					■	
	Singing Assessment		■					■
	Pupil Questionnaire		■					■
	Session observations				■			■

The NLO musicians worked in pairs in each school, as shown in Table 3.

Table 3: Pairings of practitioners working in each of the three case Primary schools

Practitioners	School
Performance poet (I) and Singer/Songwriter (II)[2]	A
Performance poet (I) and Musician (III)	B
Performance poet (I) and Musician (III)	C

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[2] For ease of reference, each practitioner is labeled as (I), (II), and (III) so as to differentiate between them in the learning and teaching observations (see Section 3.3).

Results

3.1 Key Objective 1: Literacy and Language Skills

Comparison of each child's scores on the tests at pre-test and post-test provides a measure of any change and improvement over the five month interval between assessments. The findings are presented for the Intervention and Control groups separately, and for the schools within the Intervention group where appropriate.

3.1.1 Language skills: Analysis of Oral Language as measured by the Bus Story

The oral transcripts were transcribed and scored[3] following the instructions in the manual[4].

Four measures were derived from the Bus Story: (i) an Information score, which measures how well the child has remembered and reproduced the information in the story and three measures of syntactic skill; (ii) the total number of words uttered; (iii) the average of the five longest utterances and (iv) the mean length of utterance. Only the Information score and the Average of the 5 Longest Sentences are reported in the manual, together with the number of subordinate clauses, which was not measured here.

If children have sufficient language skills to be able to process and recall the key points of the story that they have heard, they are likely to be able to reproduce it accurately; the syntactic measures indicate the length of their utterances; and, as the child's control of grammar improves, it might be expected that their ability to understand the key elements of the story would also improve.

The Bus Story test was standardised on quite a small, social class III sample, which differs markedly in demographic terms from the present participants and the published norms should therefore be interpreted with caution. The manual provides information on two of the measures which were used in the present study: the Information score and Average of the 5

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[3] See Appendix 5 for an example of a transcribed and scored story.
[4] Renfrew, C. E. (1997) *Bus Story test: Renfrew Language Scales*. Speechmark Publishing Ltd.

Longest Sentences (A5LS); for children aged 6:10, the published norms suggest an Information score of 30 and A5LS score of 11. The scores for the present participants as a collective, at the start and end of the study, are shown in Figure 2 below.
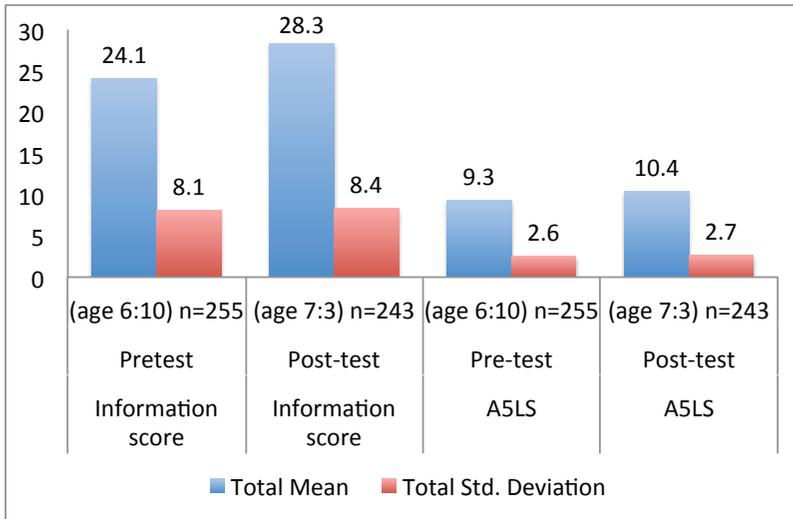

Figure 2: Scores for Information and Average of 5 longest sentences from the Bus Story (Renfrew, 1997), at pre-test and post-test, for the NLO participants as a whole across both Intervention and Control groups

In comparison to the published norms, the scores indicate that, on average, the children in the present research were over a year below on the Information score at both pre-test *and* post-test, and almost a year behind on A5LS.

The mean scores for each category of school (Intervention and Control) at pre-test and post-test on these two aspects of the Bus Story are shown in Figure 3 below.
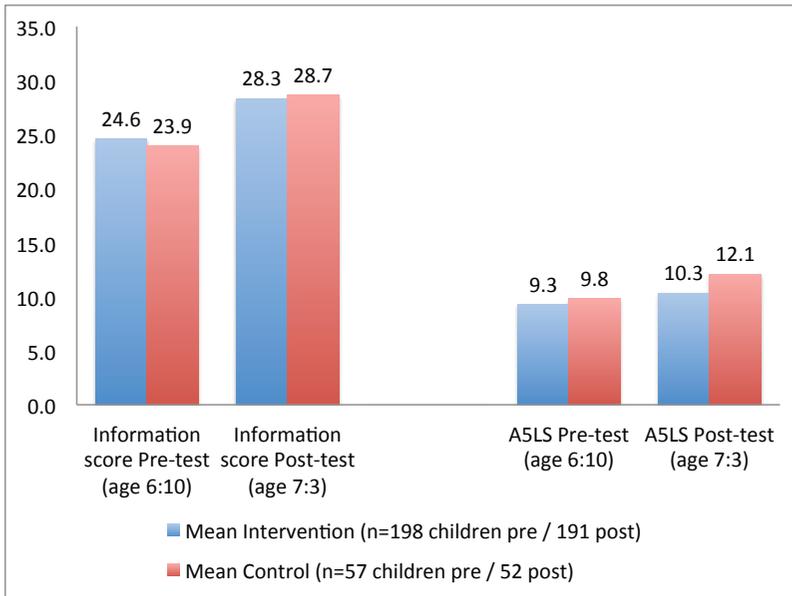
Figure 3: Pre- and post-test scores for Information score and Average of
5 Longest Sentences, for Intervention and Control groups

    The scores for Mean Length of Utterance (MLU) and Total number of words were included as additional measures of syntactic control. On both of these measures, the Control group appears to have made greater gains than the Intervention group. The detailed statistical analyses for the differences in these and other Bus Story elements are reported in Tables 4 and 5 below.
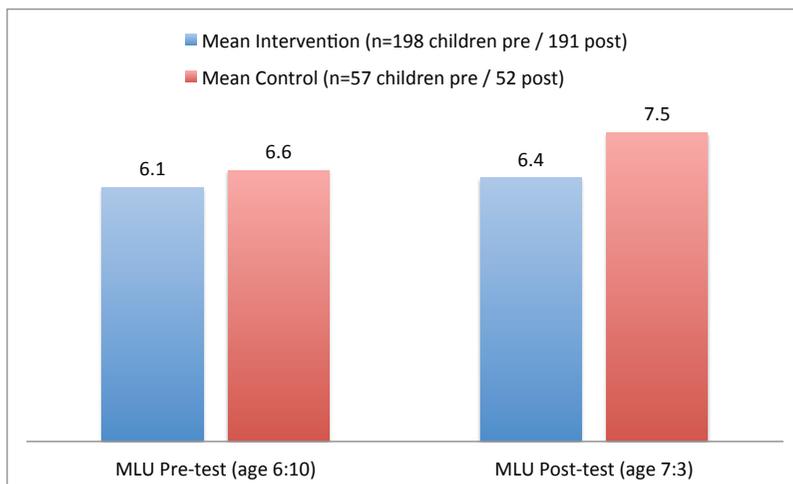
Figure 4: (a) Pre- and post-test average scores for Mean Length of Utterance for each group, Interventional and Control
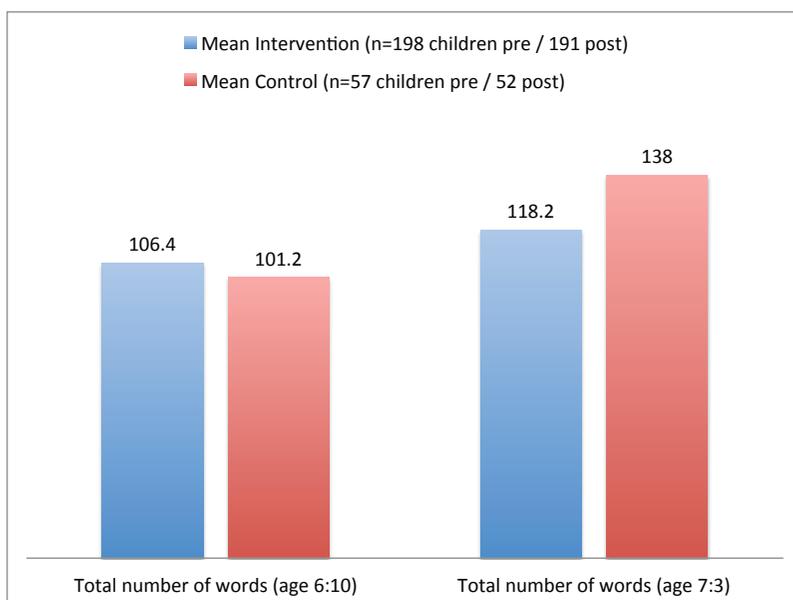

Figure 4: (b) Total average number of words for each group, Intervention and Control

Table 4: Inferential statistical comparison of the Intervention and Control groups at pre-test and post-test on all oral language measures

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Information Score Pre-test	Between Groups	1.708	1	1.708	.026	.872
	Within Groups	16611.563	253	65.658		
	Total	16613.271	254			
A5LS Pre-test	Between Groups	18.260	1	18.260	2.771	.097
	Within Groups	1667.309	253	6.590		
	Total	1685.569	254			
MLU Pre-test	Between Groups	9.620	1	9.620	5.410	.021
	Within Groups	448.117	252	1.778		
	Total	457.737	253			
Total No words Pre-test	Between Groups	977.434	1	977.434	.804	.371
	Within Groups	307618.149	253	1215.882		
	Total	308595.583	254			
Information Score Post-test	Between Groups	7.884	1	7.884	.113	.737
	Within Groups	16843.968	241	69.892		
	Total	16851.852	242			
A5LS Post-test	Between Groups	187.676	1	187.676	28.884	.000
	Within Groups	1565.900	241	6.498		
	Total	1753.576	242			
MLU Post-test	Between Groups	54.215	1	54.215	30.969	.000
	Within Groups	421.902	241	1.751		
	Total	476.117	242			
Total No words Post-test	Between Groups	17691.323	1	17691.323	14.283	.000
	Within Groups	299754.231	242	1238.654		
	Total	317445.553	243			

The data (Table 4) indicate that the only measure on which Control and Intervention groups were significantly different at *pre-test* was Mean Length of Utterance, where the Control group had a higher score. However, on the *post-test* comparisons there were significant differences on three measures: Average of 5 Longest Sentences (A5LS), Mean Length of Utterance (MLU), and Total number of words, and the children in the Control group had higher scores on all these measures. The Information score did not differ significantly between the groups on either pre-test or post-test.

Accordingly, further statistical Analyses of Covariance were undertaken on all four oracy measures to see whether the differences between the Intervention and Control groups were significant after controlling for pre-test scores. Whilst there was no significant difference between the Intervention and the Control groups in the gains made on the Information score (p=0.8, n.s.), the other three measures of syntactic maturity were

significantly different. On these three measures (A5LS, MLU, Total number of words), the Control group's gains were significantly greater (p<.001) than those of the Intervention group. Thus, although both groups made some gains, the project did not appear to have a significant effect on the oral language scores of the children in the Intervention group, as measured by the Bus Story test.

3.1.2 Reading: The New Group Reading Test

This test is standardised to have a mean score of 100 and a standard deviation of 15; the scores of the participants as a whole were slightly below the average norms for this age-group. The Control group showed very little (statistically non-significant) improvement over the five months of the intervention, gaining less than two months of reading age (1.8 months) as measured by this test. However, in contrast, the Intervention group gained on average over eight months in terms of reading age (8.4 months, a significant improvement), and their standard scores were only just below average by the end of the intervention (see Figure 5 below and footnote table below)[5]. A repeated measures ANOVA with between-subjects factors was employed to compare the effects of interventions on the Intervention group's Reading Age scores (α =0.05). Given the existence of only two conditions (pre- post- intervention), violation of sphericity could not be addressed and, therefore, no correction of degrees of freedom was performed. The analyses suggest that there was a significant

effect for time (pre -vs- post intervention), Wilks Lambda = .828, $F(1, 222)$ = 46.061 [p < .0001, multivariate partial eta squared .172]. There was also significant interaction between time and school type (i.e. control -vs-intervention) ($F(1, 222)$ = 17.080, p <.0001, multivariate partial eta squared .071). This indicates that time had a differential effect on pupils' measured reading age, depending on whether they were in the Control or Intervention group. This is evident in the mean scores as illustrated in Figure 5.

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[5] NGRT scores for reading assessments by Intervention and Control groups, pre- and post-test

| Group	N		Mean	SD	t	p
Control group	48	Pre	97.2	10.7		
		Post	97.7	11.1	-0.68	0.50
Intervention group	176	Pre	94.1	13.6		
		Post	98.6	13.5	-7.78	.000
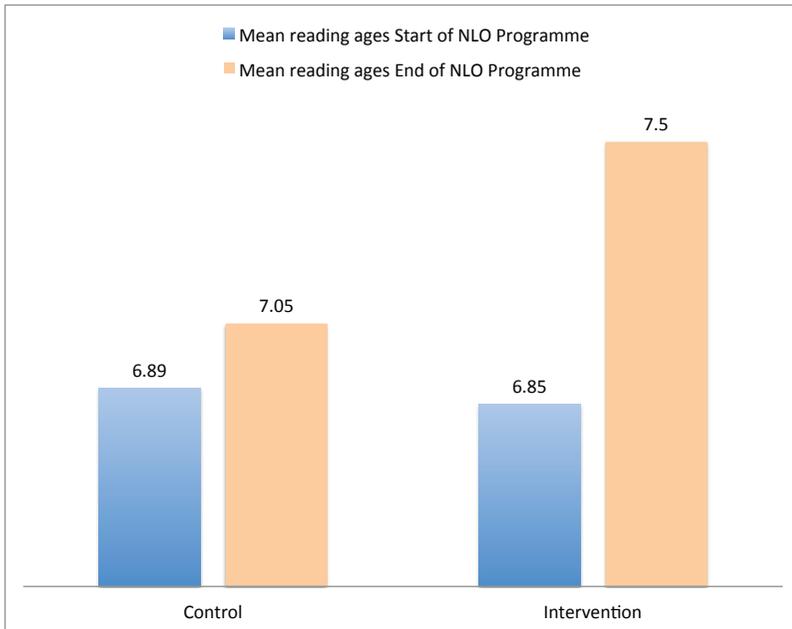
Figure 5: Reading ages based on NGRT standard scores for Intervention and Control groups, at pre- and post-test, beginning and end of the NLO Programme

In summary, the Control group showed no significant gain in their reading ages between the two assessment points, five months apart, whilst the Intervention group's reading scores improved significantly. Table 5 illustrates the mean changes by class group in each of the Intervention schools and Control school. Of the seven classes in the Intervention category, the smallest mean gain in reading age was 4.8 months and the largest was 13.2 months. All the changes were highly significant statistically. In contrast, one Control class had a reading age mean gain of 3.6 months, which was significant, but not by the same degree; the other Control class' mean score was unchanged.

Table 5: Reading age changes by class and group (Intervention vs Control)

			Mean class reading age change in months	Statistical Significance
Intervention	School 1	Class a	10.8	t(24)=4.34, p<.001
		Class b	6	t(25)=3.65, p=.001
	School 2	Class c	4.8	t(25)=3.38, p=.003
		Class d	9.6	t(26)=4.30, p<.001
	School 3	Class e	7.2	t(27)=3.48, p=.002
		Class f	7.2	t(25)=5.26, p<.001
		Class g	13.2	t(24)=6.96, p<.001
Control	School 1	Class x	0	t(25)=.215, p=.832 ns
		Class y	3.6	t(23)=2.23, p<.05

Inspection of the reading age data for gender differences revealed no significant differences between girls and boys, indicating that the NLO Programme had an equally beneficial effect on both sexes in the Intervention schools.

Overall, the two types of literacy assessment suggest that the NLO Programme had a particular impact on participant children's reading development compared to the Control group children, but this was not evidenced to the same degree on their oracy development. This may be because of the nature of the NLO Programme design, which perhaps involved more reading than talk (and see section on Observations below).

3.2 Key Objective 2: Musical Development

3.2.1 Singing development

All the children significantly improved their singing assessment scores across the five months. However, the Intervention group's improvement was significantly greater (Figure 6). A one-Way Analysis of Variance that compared singing assessment scores at the beginning of the Programme revealed that the two groups (Control and Intervention) were identical (F(1, 188) = .209, p=.648, ns). However, when the singing assessment was repeated at the end of the Programme, although both groups had improved, there was now a significant difference between them (F(1, 176) = 6.031, p=<.02). Children in the NLO Programme had improved significantly more than those in the Control group.

Singing Assessment
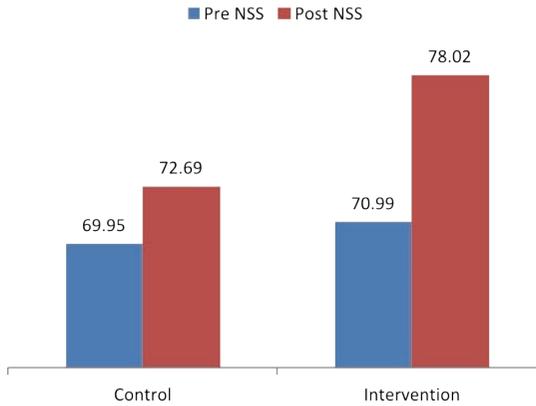
Figure 6:   Mean Normalised Singing Scores (NSS for Control and Intervention groups, pre- and post-intervention

Similarly, an assessment of changes in children's mean sung vocal range in semitones across the period of the NLO Programme also revealed differences between the Intervention and Control groups (see Table 6). One-way Analyses of Variance indicated that there was no significant difference in mean vocal range for the Control participants ($F(1,111) = .223$, p=.637, ns). In contrast, there were highly significant positive increases in two of the three Intervention schools ($F(1,99) = 8.702$, p<.005; $F(1,157) = 27.116$, p<.001). In the other Intervention school (3), there was no significant change, but they had started from a high mean range initially (see Table 6 for comparative vocal range means at the beginning and end of the NLO Programme).

Table 6: Comparison of mean sung vocal range in semitones at the beginning and end of the NLO Programme for Control and Intervention schools

Sung vocal range (in semitones)			
Participants	At the beginning of the NLO Programme	At the end of the NLO Programme	Statistical significance of change
Control School	11.86	12.18	$F(1,111) = .223$, p=.637, ns
Intervention School 1	12.94	15.82	$F(1,99) = 8.702$, p<.005
Intervention School 2	10.44	13.53	$F(1,157) = 27.116$, p<.001
Intervention School 3	14.11	14.72	$F(1,106) = .577$, p=.449, ns

3.2.2 Attitudes to Music

Children completed a thirty-question survey instrument that explored six different aspects of their musical identities and attitudes to music and school. Three of the six themes related to music; the other three were non-music focused. The themes covered: (1) attitudes to singing and music in school; (2) their sense of self-identity as a musician; (3) their emotional engagement with music; (4) sense of self; and (5) sense of social inclusion (see Appendix 1). There were no measurable changes across the five months in the answers to the questionnaire. All pupils, irrespective of whether in Control or Intervention schools were positive at the beginning of the Programme and continued to be so, which could be a factor of the short timescale. Research reported elsewhere for over 10,000 children (Welch et al, 2010) indicates that a positive sense of self and social inclusion are highly correlated with development in singing, a feature of the Intervention Group (as reported in Figure 6 above).

3.3 Key Objective 3: Enhancing Teachers' Skills and Confidence in using music in the classroom

One key objective of the intervention was to enhance both the skills that teachers already possessed, as well as their confidence to approach musical activities within the classroom. During each workshop, the practitioners modelled songs, rhythms and activities with the pupils and encouraged the teaching staff to rehearse these activities during the rest of the school week, thereby linking the activities of the intervention with the daily learning activities of the pupils. Within the classroom, the practitioners created a framework of activity in which the pupils could work and achieve. Teachers were able to observe how the activities were introduced and extended and, as appropriate, asked to join in so as to experience the activity for themselves. The aim of the activities focussed on specific elements of music, including, for example (i) rhythmic skills, (ii) pitch matching, (iii) ostinato, (iv) dynamics, (v) timbre, (vi) breathing skills, (vii) ensemble skills, (viii) composition and (ix) wider musical knowledge (genre specific). In addition, activities based around the use of language were introduced, including, for example (i) narrative structure, (ii) rhyming schemes, (iii) similes and metaphors, (iv) synonyms, (v) adjectives and (vi) wider knowledge of languages from around the world.

In the following examples of good practice[6], descriptions of the activi-

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[6] The following examples are taken from a set of lesson observations completed towards the end of the Spring term (April 2011) and again towards the end of the Summer term (July 2011). Good practice in this setting refers to those sessions observed that were deemed to be good or above according to an application of criteria from the Ofsted (2009) *Making More of*

ties undertaken by the practitioners are given. These descriptions, along-side some examples of the supporting activities provided by the class teachers begin to unpick how the partnership between the practitioners and teaching staff[7] was able to create a positive and supportive classroom, in which pupils were able to engage and achieve in aspects of both music and literacy. From the relatively small number of observations made (n=14), findings are compared with existing evidence reported from research into other music-based interventions in both the formal and non formal sector of education (Saunders et al, 2011, Saunders & Welch, 2012).

3.3.1 Learning and teaching observations: examples of effective practice

In most settings, two sessions were observed for each participating class within the intervention schools[8] and observation schedules were completed for the practitioners (see Appendix 3a) and pupils (see Appendix 3b). In addition, a post lesson evaluation (see Appendix 4) was completed for each observed session. The completed observation schedules detailed the activity for each minute of the session. The following examples focus on illustrating specific activities (see Section 3.3.1) and a central core of activities that were common across all observed sessions (see Section 3.3.2).

Music: Improving the quality of music teaching in Primary schools. Additional observations and comments from the teaching staff and practitioners were gathered throughout the duration of the fieldwork. An examination of teacher feedback has been reported previously (see Knight, 2011).

[7] Research is currently being undertaken with the NLO and schools in Newham, to ascertain the extent to which teachers attending workshops, specifically designed to teach them how to approach these musical activities, feel (i) better equipped and (ii) more confident in their professional practice. Initial findings will be reported in the Autumn of 2012.

[8] For the three intervention schools, each class was observed twice, apart from School A. The first session of Class 2 in School A was attended by members of the research team to familiarise themselves with the nature of the intervention, prior to the completion of formal observation schedules. In addition, one observation was completed of a session in which more than one class (and the teaching staff) were present. These 'sharing assemblies' took the form of an adapted session, in which pupils from other year groups were invited to participate in activities with the Year 2 pupils modelling for their peers.

Between January and July of 2011, 14 session observations were completed in the three intervention schools.

School	Spring term, 2011	Summer term, 2011
School A	1 observation of Class 1	1 observation of Class 1
		1 observation of Class 2
School B	1 observation of Class 1	1 observation of Class 1
	1 observation of Class 2	1 observation of Class 2
	1 observation of Class 3	1 observation of Class 3
		1 observation of an assembly
School C	1 observation of Class 1	1 observation of Class 1
	1 observation of Class 2	1 observation of Class 2

Figure 7: Research schedule for observations across three intervention schools

None of the following examples are presented as a single, ideal model – but rather to illustrate the wide variety of successful approaches encountered. Some of the activities can be seen as exclusively focussed on an aspect of musical development (see Activity 1, for example below). Some are more specifically focussed on the development of an aspect of literacy (Activity 3, for example), whereas others blend musical starting points with the opportunity to play and explore language within the oral tradition of music making (Activity 2, for example).

Activity 1: Clapping rhythms
Practitioner III clapped a simple rhythm to the class (slow, slow, quick quick, slow) alongside the spoken phrase 'don't clap this one back'. In a series of increasingly complex call and response clapping rhythms[9], the pupils were required to remember and perform each clapped rhythm, perform as a class, maintaining the sense of pulse and, when presented with the slow, slow, quick quick, slow pattern, respond verbally with 'don't clap this one back' in preference to a clapped pattern. Over a short space of time (2-3 minutes) the sense of pulse displayed by the pupils grew stronger and their ability to remember longer and more intricate phrases improved. Pupils were invited to create rhythms for the rest of the class to respond to, allowing different members of the class to control the activity.

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[9] This activity was often used to begin the workshops with many of the classes. The practitioners would enter the classroom and begin clapping. This activity helped to establish the starting point of the workshop (without the need for verbal instruction) as well as establishing the accepted 'way of being' for the duration of the session. The pupils responded positively to the active, often fast-paced approach of the NLO practitioners.

Activity 2: 'Long time gal mi neva see you' Jamaican Creole Song

Practitioner I sang, unaccompanied, a Jamaican song (see Figure 8). After his performance, during which the pupils watched and listened without movement, he explained the differences in language, for example the 'peel head John Crow' (a bald headed vulture), illustrating the need to adopt an authentic pronunciation of the language in order to perform the song properly. He encouraged the pupils to explore the language being used and to offer alternate meanings for the descriptions. He then added actions to demonstrate that the song was to accompany a simple dance between the male and female pupils. The pupils were able to enter into the spirit of the song and suggested different explanations of

Activity 2:

'Long time gal mi neva see you
Come let mi hole yuh han
Dis long time gal mi neva see you
Come let mi hole yuh hand.
Peel head John Crow sit pan the tree top
Pick out the blossom
Let mi hole yuh han Gal
Let mi hole yuh han.'
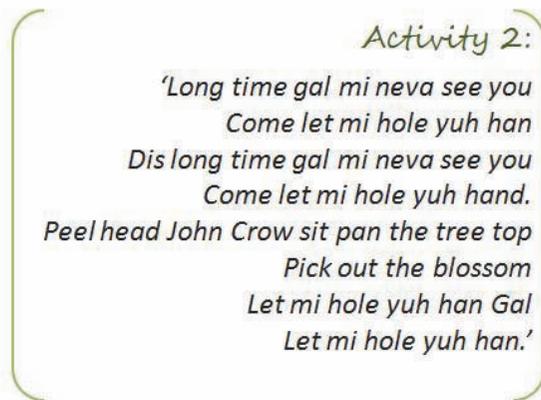
Figure 8: Example of Language use in the session

homecomings, meeting with old friends, meeting with girl or boy-friends. They danced rhythmically, underlining the strong pulse. Over the course of a six minute activity, the pupils had learnt a song through call and response, learnt a simple dance to accompany it and, for some, widened their knowledge and language of different musical cultures. In addition, pupils were able to share, through long dialogues, universal concepts such as familial relationships. Importantly, for some pupils, this was not a new song and they were able to demonstrate that this song was part of their own cultural understanding and heritage.

Activity 3: Playing with words 1

This activity was initiated 'outside' of the formal learning activities; its starting point being a verbal exchange between Practitioner I and a pupil who had misheard an instruction to move away from the 'carpet time' formation. The exchange led to a group exercise in which the rest of the

class took part in an impromptu rap style poetry performance. This skillful use of pupil interaction demonstrated to the class not only that their suggestions were both heard and valued, but that language is something with which to play and experiment. The spontaneity of the Practitioner's response further illustrated the necessity that each practitioner is able to approach literacy via multifarious strategies, according to the needs of, and interactions with, pupils (see Figure 9).

> ## Activity 3:
>
> A pupil asks 'why are we sitting in the middle?'
> The practitioner responds...
> 'Why are you sitting in a muddle,
> In a puddle,
> In a piddle,
> Talking in riddles,
> Riding side saddle?'
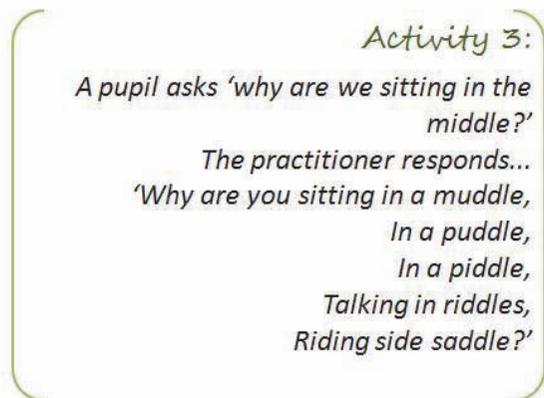
Figure 9: Example of Improvised Language use is sessions.

Activity 3: Playing with words 2

As part of a larger scheme of work based upon traditional tales, Practitioner I introduced his re-interpretation of the story of Little Red Riding Hood, in which 'Red' was a cruel and vindictive girl and the wolf complained of being misunderstood. During an extended period (12 minutes) of group work, pupils were asked to think about how to describe these key characters. All of the pupils were familiar with the traditional setting of the tale and enjoyed exploring the alternative version. Each group of pupils worked to describe either 'Red' or the wolf, with an adult[10]. Practitioner I brought the groups together to share their thoughts. At this stage, each group offered words for consideration by the rest of the class. Those thought to be valuable by other pupils were recorded by the class teacher, who acted as scribe for the whole class. The list of words was displayed throughout the duration of the following week (see Figure 10), being used to support a creative writing task initiated by the class teacher. Therefore, the activities completed within the intervention session provided starting

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[10] In this class, two teaching assistants, the class teacher and the two practitioners were present to work alongside the pupils.

points for the class teacher to follow up in more detail, or apply to other areas of learning at a later stage. Although very little reading or writing by the pupils took place *within* the intervention session, the sessions provided the stimulus and creative input to support reading and writing based tasks during the curriculum time that followed. Examples of effective practice such as these reveal the need to develop and maintain close working partnerships between class teachers and the practitioners.

Activity 3:

'The Good Wolf' describing words...
Grateful, kind,
vegetarian, generous,
helpful, sweetest,
friendly, sensitive,
good, happy,
warm-hearted
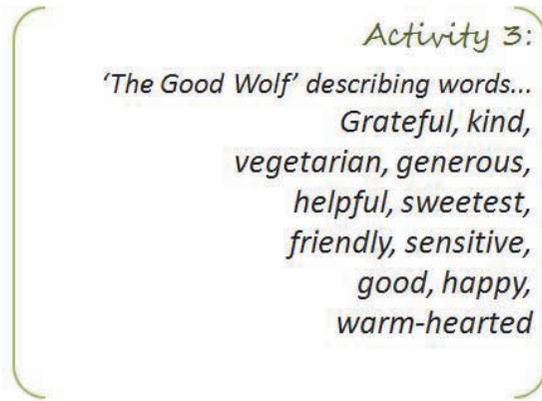
Figure 10: Example of Word Lists created to support learning beyond the intervention session

3.3.2 Learning and teaching observations: Effective practice across sessions

Throughout Section 3.3.1, examples of effective practice have been highlighted as isolated incidents. Over the following discussion, the observational data from complete sessions is presented, embedding isolated tasks within the flow of a longer series of interactions. During a session, a researcher observed, but did not participate in, the unfolding events. The observation schedules (see Appendix 3a and 3b) were based upon those used to research effective practice of vocal leaders in Primary school settings[11]. Each schedule allowed the researcher to record the observable behaviours of both the practitioners and pupils over time. An activity was noted for each minute of the session, although multiple entries could be made so as to depict the 'multi-tasking' approach often required in a learn-

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[11] For further details of the design and analysis of observational data see Saunders, J., Papageorgi, I., Himonides, E., Rinta, T., & Welch, G.F. (2011). *Researching the Impact of the National Singing Programme 'Sing Up' in England: Diverse approaches to successful singing in Primary settings*. London: iMerc.

ing context. In combination, the two schedules could together describe the interactions taking place between practitioner and pupil, noting when an individual was seen to 'act' on the musical or literacy-based material in some way. The recording of this 'action' provided evidence that particular musical or literacy-based behaviours were occurring and, by inference, that a positive developmental change was taking place. Of the 14 sessions observed, 3 are included here as representative of both the quality and variety of activities undertaken. Broadly, the intervention sessions could be seen to adhere to three models (see Figure 11).
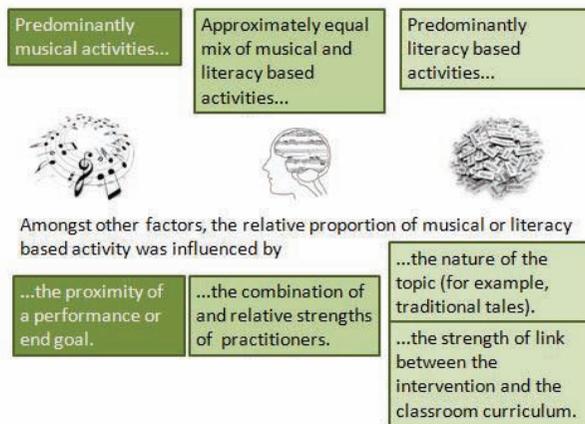
Figure 11: Three broad models of session, defined primarily by the relative proportions of musical and literacy based activities

In each of the following examples (Section 3.3.2.1, 3.3.2.2 and 3.3.2.3) the data is presented for both pupils and practitioners in the same format. Following the session, each record of activity was coded according to a colour (for example, all observations of the practitioner vocalising were coloured bright red). This created a visual record of the activities played out over time. Running through each record were 'ribbons' of colour, showing the dominant activities observed within the session. Further to this pattern of activity over time, explanatory notes were added that sought to describe the interactions between the practitioners and the young people, revealing both the shape and pace of the session.

3.3.2.1 Learning and teaching observations: Session of predominantly musical activities

This session lasted just over 50 minutes and was led by Practitioners I and III. It began with a clapping exercise in which the pupils were expected to learn through the modelling of the task. There was limited

teacher talk other than by Practitioner I, who narrated his own physical activity, highlighting the success criteria through a reflective examination of what he was achieving and those areas on which he needed to focus. This created a strong and accessible model for the pupils to imitate. As the session progressed and the activities developed, the practitioners were able to create a tightly woven pattern in which they modelled an increasingly difficult task, and then supported the pupils as they sought to refine their own work through specific feedback and further modelling. Interspersed were very short cycles of activity in which the practitioner asked the pupil to demonstrate mastery of the new material. This was followed by oral feedback and a brief celebration of achievement. In predominantly musical activity-based sessions, these periodic reviews of skill development were a particular feature, as was the use of predominantly closed questions. As can be seen from Figure 12, the pupils were engaged for a high proportion of the session. Most of their actions were based around imitating the practitioners, listening and vocalising. There was an established sense of how to behave and respond in a musical manner. The practitioners spent much of the session creating a musical sound world, through rhythm and melody. They constantly modelled and supported the performance of the pupils. There were pockets of teacher talk – but these consisted of (i) a narration of activity (a voicing of the processes involved in a novel task), (ii) a tightly focused examination of the success criteria and a review of progress in relation to that, or (iii) the provision of contextual information to ensure that learning did not take place within a vacuum. The pacing of the session was fast, full of energy and began and ended in sound.
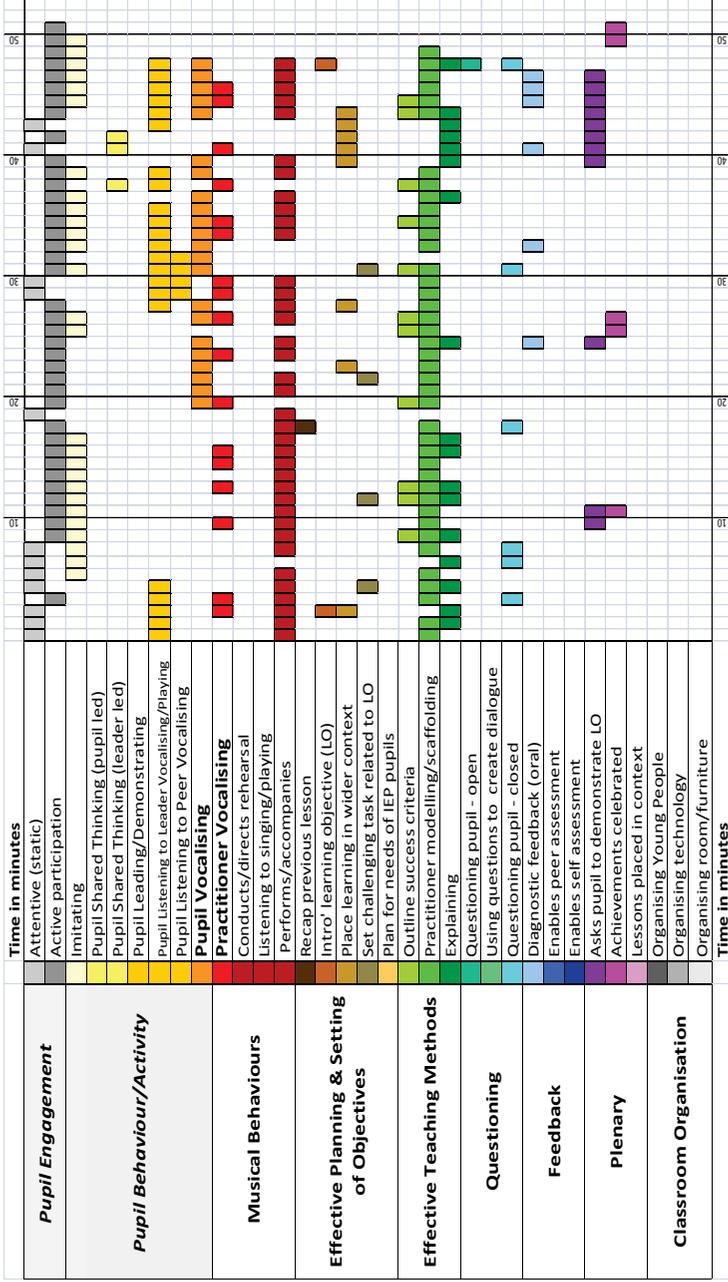
Figure 12: Observation of Predominantly Musical Activity-based session
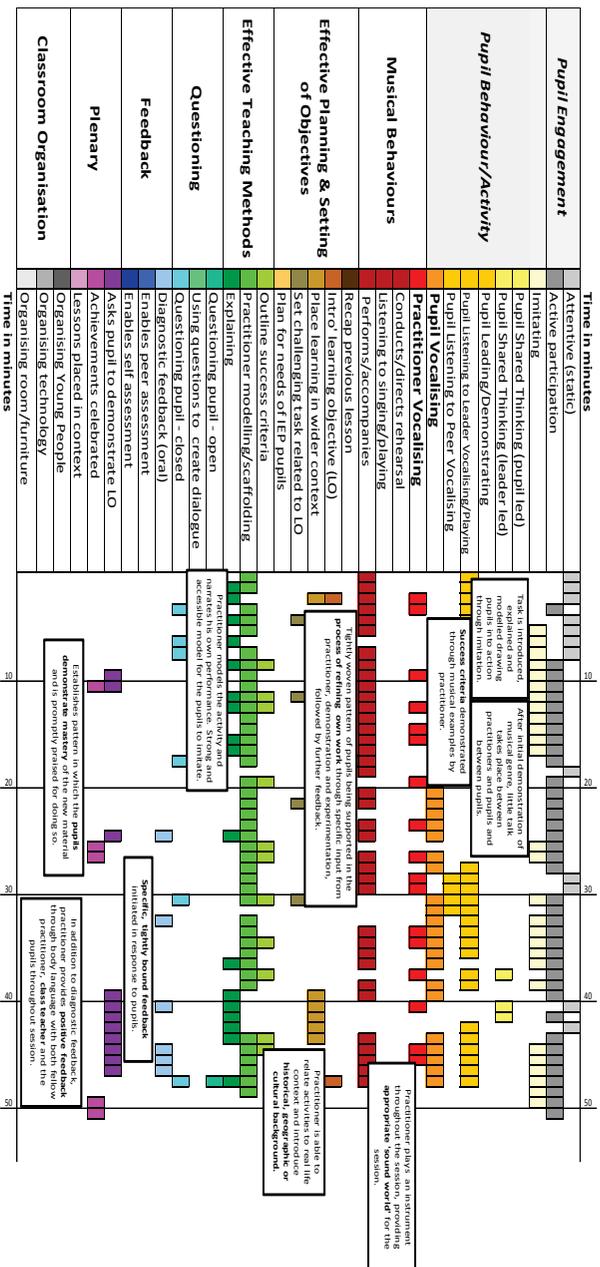
Figure 13: Example of Predominantly Musical Based-activities session with explanatory notes

3.3.2.2 Learning and teaching observations: Session of musical and literacy based activities

This session, lasting 50 minutes, was led by Practitioner I and III (see Figure 13). The activities began from the moment the practitioners walked into the classroom. This instantly established a sense of energy and pace that was maintained throughout the session. Practitioner III led clapping activities, focussing on accuracy and building complexity as the session progressed. Practitioner I acted to support individual pupils, with stage whisper hints and tips for those pupils who needed it. This strategy ensured that all pupils remained engaged throughout the activity. Approximately 12 minutes into the session, Practitioner I took the lead and widened the task beyond rhythmic accuracy, introducing patterns of words and syllables. At this stage (see Figure 13) the quantity of pupil and teacher talk increased. Questioning techniques included closed, open and prompts designed to create dialogue. The extended questioning gave pupils the opportunity to participate in long dialogues, in which they were encouraged to think aloud (speculative talk). The pace of the session was maintained. Each time a pupil offered an idea it was woven into the fabric of the activity. By so doing, the practitioners were explicitly valuing the pupil responses and enabling the pupils to shape their own learning experiences. Throughout the activities, the practitioners constantly modelled tasks and supported those individuals who required additional input.

After 30 minutes of the session had passed, the practitioners asked the pupils to jump up and 'roar' as loudly as they could. Having spent a considerable amount of the session in the 'carpet time' formation (where pupils sit as a group on the floor of the classroom) the practitioners introduced a short release of energy, allowed a moment of intense physicality and that also enabled pupils to experiment with their voices. In a 'bubbly' class that was reported to require careful management, this demonstrated an understanding of the need to address a wide range of needs in order to establish and maintain engagement in the learning process. Across the sessions observed that conformed to this broad model of both musical and literacy based activities, it was a recurring feature that the music based activities were most likely to begin and end the session, with literacy-based activities embedded within the central section. This ensured that the literacy-based activities (that formed a grounding for work in the classroom during the following week) were cushioned from the potential interruption of playtime or lunchtime.
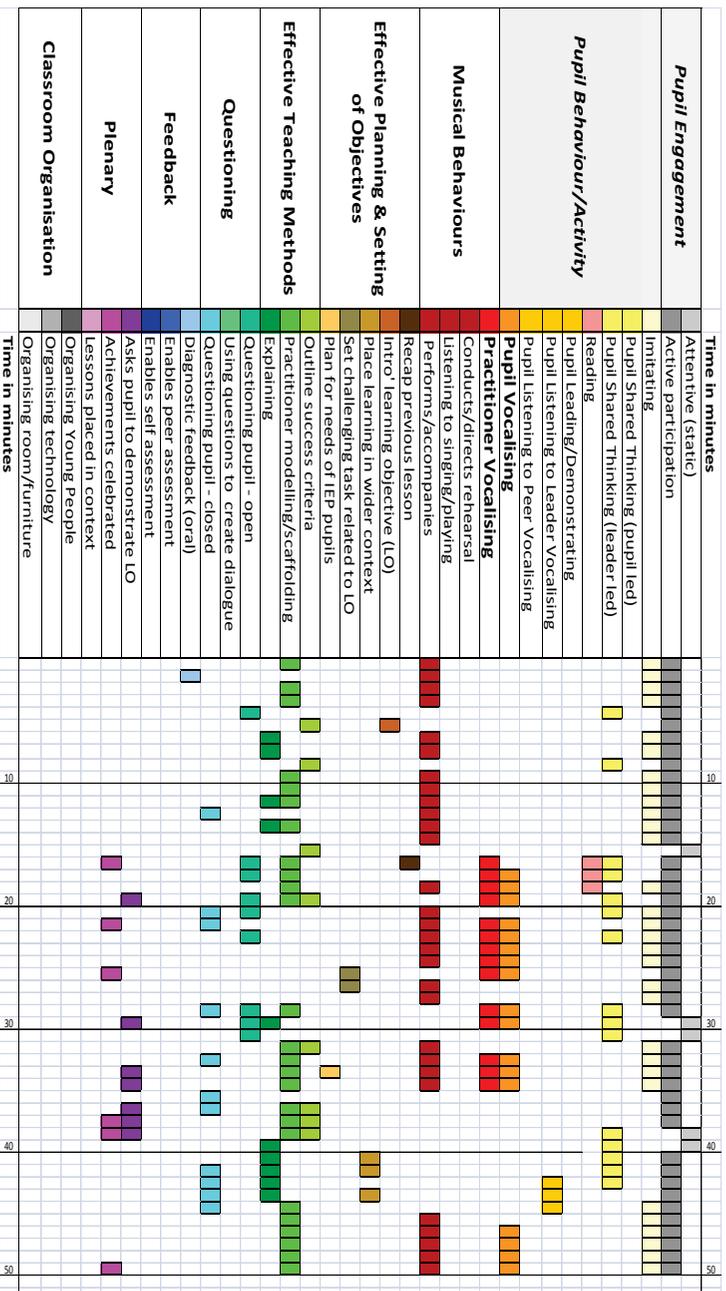
Figure 14: Observation of approximately equal balance of Literacy and Musical Activities-based session
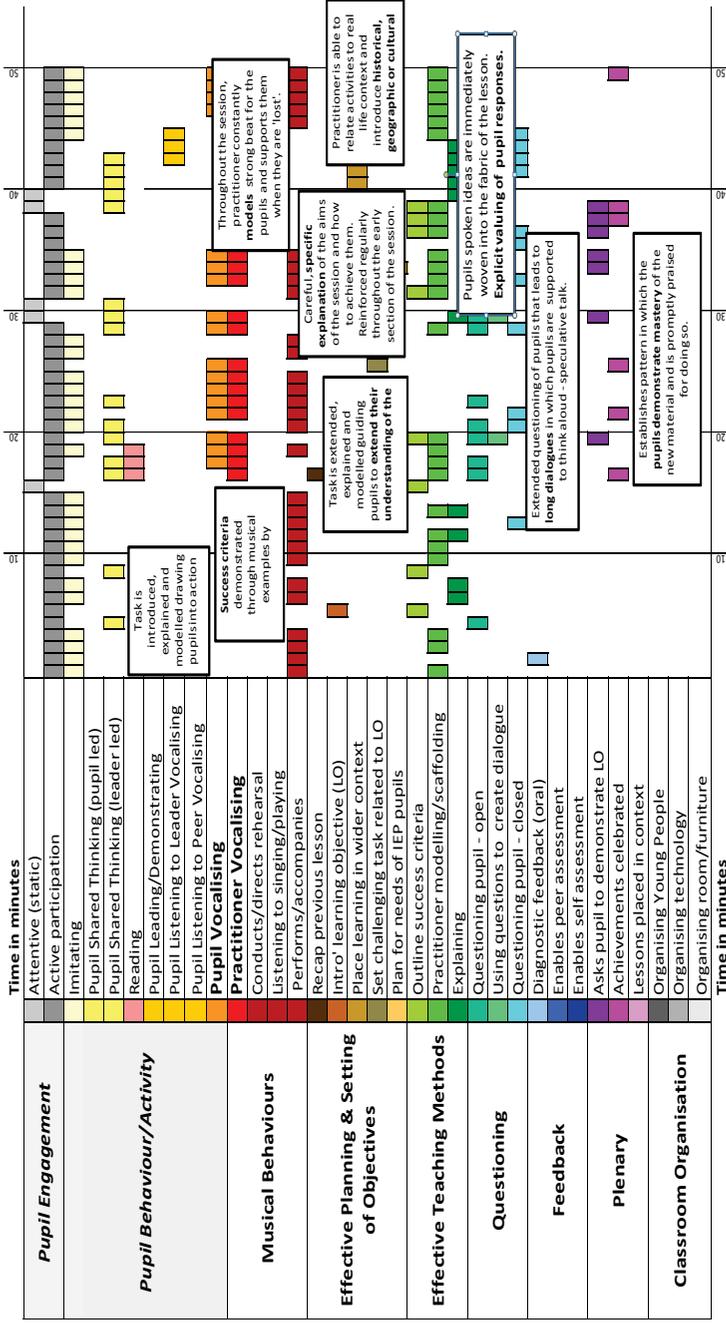
Figure 15: Observation of approximately equal balance of Literacy and Musical Activities session with explanatory note

3.3.2.3 Learning and teaching observations: Session of predominantly literacy based activities

This session, lasting 45 minutes, was led by Practitioner I and II. It was a high impact, high energy session, with the pupils actively engaged for a large proportion of the time. The first third of the lesson focussed on the creation of different elements needed to create a song. Word banks and simple graphic scores were created during the session to support the learning of the pupils and act as lesson prompts for the teachers. Examples of these can be seen below (see Figure 16).
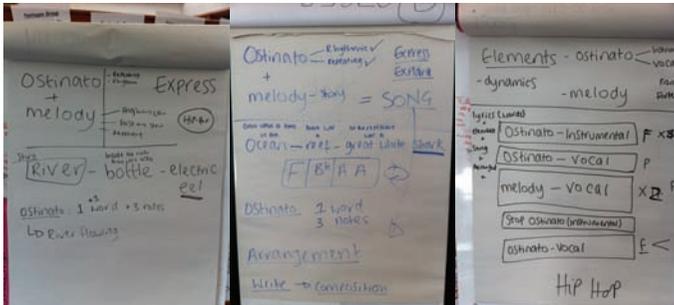

Figure 16: Word bank and visual representations of the developing activities

In addition to activities previously observed (see Section 3.3.2.1 and 3.3.2.2), a particular feature of these sessions was the way in which the practitioners were able to create extended periods of time (see Figures 17 and 18) in which the pupils were encouraged and supported to play with elements of oral language (for example, sounds or prosody). Throughout these periods, the practitioners created a tightly woven pattern in which the pupils were supported in the process of refining their own work through specific input, either through modelling, or open questions. During group work, adult participants (teachers, teaching assistants and practitioners) acted as scribes for each group ensuring that the creative input was not constrained by issues relating to spelling or handwriting. These periods of group work were predominantly leader led, but built on the suggestions of pupils through the use of a wide variety of questioning techniques, from closed questions to those that elicit long dialogues that allow the pupils to think out loud.

Figure 17: Observation of Predominantly Literacy Activities based session

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Time in minutes

Pupil Engagement	Attentive (static)
	Active participation
	Imitating
Pupil Behaviour/Activity	Pupil Shared Thinking (pupil led)
	Pupil Shared Thinking (leader led)
	Pupil Leading/Demonstrating
	Pupil Listening to Leader Vocalising
	Pupil Listening to Peer Vocalising
	Pupil Vocalising
	Practitioner Vocalising
Musical Behaviours	Conducts/directs rehearsal
	Listening to singing/playing
	Performs/accompanies
Effective Planning & Setting of Objectives	Recap previous lesson
	Intro' learning objective (LO)
	Place learning in wider context
	Plan for needs of IEP pupils
	Outline success criteria
Effective Teaching Methods	Practitioner modelling/scaffolding
	Explaining
	Questioning pupil - open
Questioning	Using questions to create dialogue
	Questioning pupil - closed
	Diagnostic feedback (oral)
Feedback	Enables peer assessment
	Enables self assessment
	Asks pupil to demonstrate LO
Plenary	Achievements celebrated
	Lessons placed in context
	Organising Young People
Classroom Organisation	Organising technology
	Organising room/furniture

Time in minutes

Task is introduced, explained and modelled drawing pupils into action through imitation.

Task is modified, explained and modelled enabling pupils to build on activities through

Task is extended, explained and modelled guiding pupils to **extend their understanding of the task.**

Extended periods in which pupils are encouraged to play with **elements of oral language** - sounds, grammar, prosody,

Extended questioning of pupils that leads to **long dialogues** in which pupils are supported to think aloud - speculative

Extended periods in which pupils are supported in their use of **elements of written language.** Teaching staff acting as scribes for each group of pupils.

Extended period of group work and discussion between pupils and practitioners which is predominantly leader-led. Builds on suggestions from pupils throughout session, including various questioning techniques and ends in sharing of ideas

Tightly woven pattern of pupils being supported in the **process of refining own work** through specific input from practitioner, demonstration and experimentation, followed by further

Figure 18: Observation of Predominantly Literacy Activities based session with explanatory notes

3.3.3 Learning and teaching observations: Common features of good practice

Examples from these three schools have illustrated that there are multiple approaches to successful musical and literacy based experiences, drawing on the individual biographies and particular skill sets of the practitioners involved. Nevertheless, there are a number of specific elements that these activities have in common. Research in other learning contexts suggests that similar observed characteristics are displayed by effective vocal leaders (Saunders et al, 2011) and effective instrumental practitioners working in the non-formal sector (Saunders et al, 2012).

Successful sessions in which the pupils enjoyed music and literacy activities were more likely to contain the following elements:

(i) A **confident model** of practitioner;

(ii) Pupils were **actively engaged for a high percentage of time** across the session;

(iii) There was the opportunity for the **pupil's voice** to be heard within the session, either being expressed in song or sound, through ideas about language and music, or used to question, reflect and review their own progress;

(iv) A **musical beginning and ending** to the session were evidenced – where the practitioner establishes a particular 'way of being' within the session;

(v) The **pupil's performance was monitored and assessed,** with high quality responses acknowledged and fed into the activity, often providing the impetus for an activity ;

(vi) A **suitably paced session was evidenced** – such as a fast paced session that enabled pupils to gain mastery of material through repetition, or a more intermittent pace that allowed space for exploring new ideas;

(vii) Learning was placed within a **wider context of the pupil's lives;**

(viii) Activities undertaken within the session were planned in order that the **class teacher could create links to learning opportunities beyond the intervention** – for example, recording the word bank created by pupils for use in creative writing.

(ix) Activities undertaken within the session were delivered in a transparent manner by the musicians that enabled the **class teacher to adopt the activities and strategies for learning opportunities beyond the intervention.**

Less successful aspects of sessions were more likely to contain an absence of the elements listed above, as well as including some or all of the following:

(i) Achievement was celebrated with **global or blanket praise**, or without specific focused feedback that enabled the pupils to improve;

(ii) The **pacing of the session (or section of the session) was weak,** lacked momentum, or activities failed to progress so as to provide challenge for the most able pupils;

(iii) Young people were **passively engaged** or disengaged for a high per-

centage of the session;

(iv) **Learning took place within a vacuum** – learning was neither related to the wider context of pupils lives, nor were activities completed within the session related to learning activities in the wider curriculum;

(v) There was **limited space for the pupil's voice** to be heard, explored or acknowledged.

Conclusions and Implications

There is an increasing body of research and commentary to suggest that engaging in music can offer the possibility of enhancing other aspects of human behaviour and development. Whilst this is not new, it is only recently that social scientists, neuroscientists and musicians have begun to collaborate systematically in empirical and experimental research to seek more robust evidence for this relationship. So far, recent studies suggest that sustained involvement in particular musical practices can have a beneficial impact on social, physical and psychological development, including selected aspects of cognitive and emotional functioning. Nevertheless, this link and potential benefit should not be assumed to be automatic, but rather that this is sensitive to the context (*cf* Barnett & Ceci, 2002; Roediger et al, 2012), including the nature of the particular musical activities, as well as to the pedagogical skills of those seeking to promote learning.

In the case of the New London Orchestra's 'Literacy through Music Programme', care was taken at the beginning of the Programme to ensure that the NLO musicians, participant teachers and teaching assistants came together to agree the principles by which they could formulate a programme of activities that linked to schools' priorities for language development in these six- and seven-year-old children. The NLO musicians were also able to build on a previous year's pilot programme that had provided them with an excellent opportunity to try out and develop key elements of the Programme. In addition, the musicians and teachers worked together across the twenty weeks (two school terms) in an iterative process where each supported the children's development and each other by drawing on their own professional strengths, whether in music, childhood literacy development or both. There were also regular opportunities for debriefing with the NLO management, as well as discussions with the Institute of Education research team prior to the commencement of the Programme and also at the mid-point after the first ten weeks.

Overall, the Programme appears to have had a positive impact on participant children's reading, whilst being nuanced by school and class context, and each individual child's learning profile. This outcome is highly commendable and testimony to the collaborative teamwork, planning and attention to detail throughout that underpinned the Programme by musicians, teachers, assistants, administrators and managers, supported by the researchers. There was also a differential positive impact on children's singing development in favour of the NLO Programme participants, which, in turn, will likely have supported these children's continued emotional engagement in the weekly NLO music sessions.

Yet, despite the measureable positive influence on reading, there was no evidence that the NLO Programme had an equivalent impact on children's oracy, at least as measured by the selected research tool, the Bus Story. Although oracy and reading are linked, it may be that the NLO Programme's verbal activities were not particularly related to promoting articulation in a story-type setting, such as was a prime focus for the selected oracy assessment tool, nor were not sufficiently sustained over time.

Although the evidenced impact on reading from the music programme is to be welcomed, more systematic research continues to be needed in order to understand the mechanism by which a particular set of musical activities might impact on this aspect of literacy. One theoretical position, drawing on example neuroscience research, posits the development of interconnection between brain regions across different activities (*cf* Atherton, 2007) to support the mechanism of transfer. But we are some way yet from having a clear understanding of how this might occur, although Patel (2010) – a distinguished neuroscientist and expert on music and language – has provided a useful and engaging overview of our current state of knowledge concerning music, evolution and the brain. Having a clearer understanding of the underlying neurological mechanisms could aid music educators in selecting the most appropriate approach to supporting literacy development through music. However, whilst this is an attractive notion, it is likely still some way in the future (e.g., Stewart & Williamon, 2008; Della Sala & Anderson, 2011).

In the meantime, we should continue to support the design of carefully constructed music programmes, such as provided by the NLO, that seek to support transfer to other aspects of the development and in which it is possible to tease out and evaluate the distinctive contributory ingredients. For example, although it was not possible within the timeframe and available budget to evaluate the detail of the partnership between the NLO and participant schools, our impression continues to be that sustained teamwork was a key component in the positive outcomes as this allowed the expert craft knowledge of each constituency to contribute to the whole which included musical as well as literacy benefits.

Acknowledgements

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Appendices

Appendix 1: Pupil questionnaire

new LONDON ORCHESTRA

IOE LONDON — Leading education and social research
Institute of Education
University of London

NLO IoE Literacy and Music Research Evaluation

Pupil Questionnaire

| School:	
Class:	
Pupil Initials:	
Pupil DOB:	
DOV:	Pre-test Post-test

Hello, can you tell me about yourself?

My name is _____

I am a girl 🚺   I am a boy 🚺

My birthday is on the _____

My teacher is called _____

Thank you. Now turn the page...
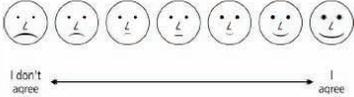
1	I sing at school	I don't agree ←————————→ I agree
2	I have lots of friends at school	I don't agree ←————————→ I agree
3	I find reading easy	I don't agree ←————————→ I agree
4	I feel confident about singing in a performance	I don't agree ←————————→ I agree
5	If something is difficult I am more likely to give up	I don't agree ←————————→ I agree
6	I like going to school	I don't agree ←————————→ I agree
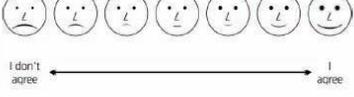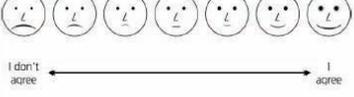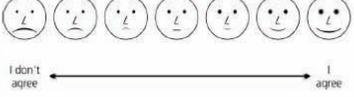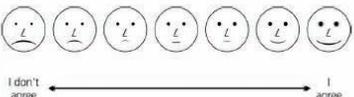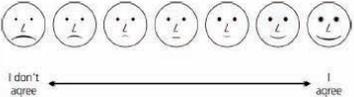
7	I feel that I am equal to everyone else	I don't agree ←————————————→ I agree
8	I have a good singing voice	I don't agree ←————————————→ I agree
9	I don't like talking in front of a group of people	I don't agree ←————————————→ I agree
10	I feel left out of things at school	I don't agree ←————————————→ I agree
11	Singing is a talent	I don't agree ←————————————→ I agree
12	Writing is hard	I don't agree ←————————————→ I agree
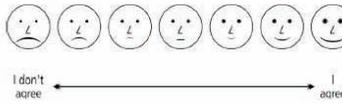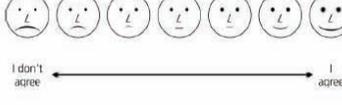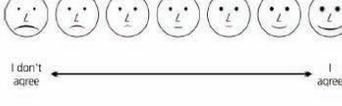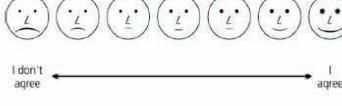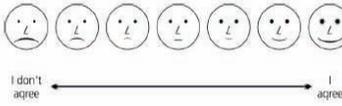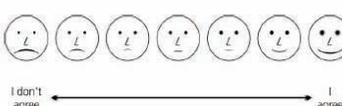
13	I like to write down my ideas	
14	Sometimes I think I am no good at all	
15	I find singing easy	
16	It's easy for me to understand what I read	
17	School music is boring	
18	I get along well with children in my class	
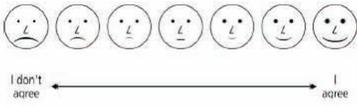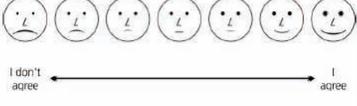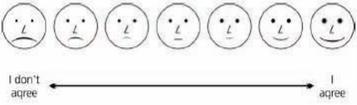
19	I am a friendly person	I don't agree ————→ I agree
20	Singing is fun	I don't agree ————→ I agree
21	I am never lonely	I don't agree ————→ I agree
22	I am not as clever as other children in my class	I don't agree ————→ I agree
23	Singing is something that everyone can do	I don't agree ————→ I agree
24	I feel good about myself	I don't agree ————→ I agree
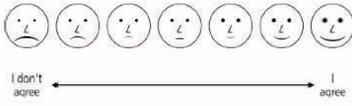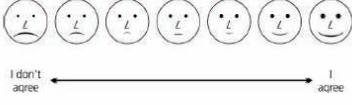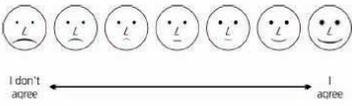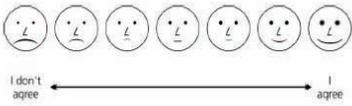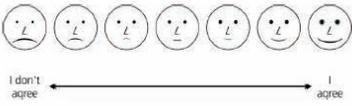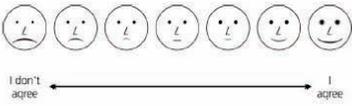
25	I can explain my ideas when I talk to other people	I don't agree ← → I agree
26	I am good at making music	I don't agree ← → I agree
27	I feel useless at times	I don't agree ← → I agree
28	Making music is fun	I don't agree ← → I agree
29	I stick to a task until it is finished, even if it is boring	I don't agree ← → I agree
30	I know the answers to questions my teacher asks	I don't agree ← → I agree
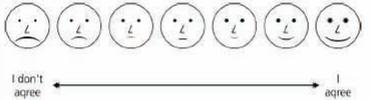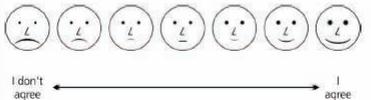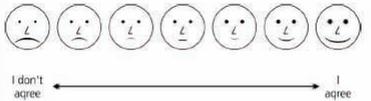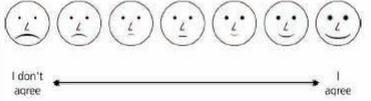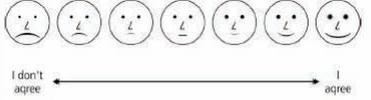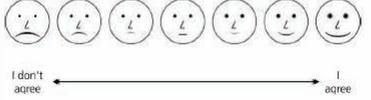
Appendix 2: Singing Assessment

National Singing Programme: Child singing assessment framework (as at October 2009)

| No SEN ☐ | School Action ☐ | School Action Plus ☐ | Statemented ☐ | Chorister ☐ | Song Leader ☐ | Song Leader Class ☐ | Other ☐ |

School Code: ☐   Child Code: ☐   Date: ☐   Visit Nr: ☐

initials: ☐   d.o.b.: ☐   Ethnicity: ☐   yyyy

speech

below a3 ☐

a#3 ☐   c#4 ☐ d#4 ☐   f#4 ☐ g#4 ☐

a3 ☐ b3 ☐ c4 ☐ d4 ☐ e4 ☐ f4 ☐ g4 ☐ a4 ☐

singing

d#3 ☐   f#3 ☐ g#3 ☐ a#3 ☐   c#4 ☐ d#4 ☐   f#4 ☐ g#4 ☐ a#4 ☐   c#5 ☐ d#5 ☐   f#5 ☐ g#5 ☐   above a5 ☐

e3 ☐ f3 ☐ g3 ☐ a3 ☐ b3 ☐ c4 ☐ d4 ☐ e4 ☐ f4 ☐ g4 ☐ a4 ☐ b4 ☐ c5 ☐ d5 ☐ e5 ☐ f5 ☐ g5 ☐ a5 ☐

song 1

Type song name IF NOT Twinkle, Twinkle:

*									
1	1.5	2	2.5	3	3.5	4	4.5	5

**			
1	2	3	4

song 2

Type song name IF NOT Happy Birthday:

*									
1	1.5	2	2.5	3	3.5	4	4.5	5

**			
1	2	3	4

*Rutkowski (1997) Singing Voice Development Measure (SVDM)   **Welch (1998) A revised model of vocal pitch matching development (VPMD)

1   "Pre-singer" does not sing but chants the song text.

1.5 "Inconsistent Speaking Range Singer" sometimes chants, sometimes sustains tones and exhibits some sensitivity to pitch, but remains in the speaking voice range (usually a3 to c4).

2   "Speaking Range Singer" sustains tones and exhibits some sensitivity to pitch but remains in the speaking voice range (usually a3 to c4).

2.5 "Inconsistent Limited Range singer" waivers between speaking and singing voices and uses a limited range when in singing voice (usually up to f4).

3   "Limited Range Singer" exhibits consistent use of initial singing range (usually d4 to f4).

3.5 "Inconsistent Initial Range Singer" sometimes only exhibits use of limited singing range, but other times exhibits use of initial singing range (usually d4 to a4).

4   "Initial Range Singer" exhibits consistent use of initial singing range (usually d4 to a4).

4.5 "Inconsistent Singer" sometimes only exhibits use of initial singing range, but other times exhibits use of extended singing range (sings beyond the register lift: bb4 and above).

5   "Singer" exhibits use of extended singing range (sings beyond the register lift: bb4 and above).

1   The words of the song appear to be the initial centre of interest rather than the melody, singing is often described as 'chant-like', employing a restricted pitch range and melodic phrases. In infant vocal pitch exploration, descending patterns predominate.

2   There is a growing awareness that vocal pitch can be a conscious process and that changes in vocal pitch are controllable. Sung melodic outline begins to follow the general (macro) contours of the target melody or key constituent phrases. Tonality is essentially phrase based. Self-invented and 'schematic' songs 'borrow' elements from the child's musical culture. Vocal pitch range used in 'song' singing expands.

3   Melodic shape and intervals are mostly accurate, but some changes in tonality may occur, perhaps linked to inappropriate register usage. Overall, however, the number of different reference pitches is much reduced.

4   No significant melodic or pitch errors in relation to relatively simple songs from the singer's musical culture.

Appendix 3a: Lesson observation schedules (Teacher / Practitioner)

School:		Year Group:						Teacher:				RO:				Visit:		
NSPR3 Pilot Observation Schedul	Code	**Teacher Activity**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A: The teacher plans effectively	A1	Recap previous lesson															
and sets clear objectives that	A2	Intro' learning objective (LO1)															
are understood	A3	Intro' learning outcomes															
	A4	Place learning in wider context															
	A5	Plan for learning needs of IEP pupils															
B: The teaching methods enable the	B1	Outline success criteria															
students to learn effectively	B2	Modelling and Scaffolding															
	B3	Sets challenging tasks related to LO1															
	B4	Shared thinking (teacher led)															
	B5	Explaining															
C: Questioning	C1	Questioning pupil - open															
	C2	Questioning pupil - closed															
	C3	Challenging higher order questions															
	C4	Uses questions to create dialogue															
	C5	No hands/brainstorm															
	C6	Wait time															
D: Feedback	D1	Relates L objectives to L outcomes															
	D2	Diagnostic feedback (oral/written)															
	D3	Time for reflection/review															
	D4	Enables peer assessment															
	D5	Enables self assessment															
E: Plenary	E1	Relate L objectives to L outcomes															
	E2	Asks pupils to discuss/demonstrate LO1															
	E3	Achievements celebrated															
	E4	Lesson placed in context for future/past															
F: Group size	F1	Group work															
	F2	Whole class teaching															
	F3	Individual work															
	F4	Paired work															
G: Singing/musical behaviours	G1	Singing															
	G2	Transmits enthusiasm															
	G3	Uses gestures to support singing															
	G4	Listening to singing															
	G5	Playing (note instrument)															
H: Classroom organisation	H1	Organising technology															
	H2	Organising staff															
	H3	Organising pupils															
	H4	Organising room/furniture															
	H5	Dealing with pupil behaviour															

Appendix 3b: Lesson observation schedules (Pupil)

NSPR3 Pilot Observation Schedule	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Pupil Activity																									
P1 Attentive (static)																									
P2 Active Participation																									
P3 Imitating																									
P4 Questioning - peers																									
P5 Questioning - teacher																									
P6 Peer working (teacher led)																									
P7 Peer working (peer led)																									
P8 Shared thinking (pupil led)																									
P9 Shared thinking (teacher led)																									
P10 Independent working																									
P11 Leading/Demonstrating																									
P12 Reading																									
P13 Writing - copying																									
P14 Writing - creative																									
P15 Drawing - copying																									
P16 Drawing - creative																									
P17 Listening - to teacher singing																									
P18 Listening - to peers singing																									
P19 Playing (note instrument)																									
P20 Singing																									
P21 Composing/Improvising																									
P22 Requesting help (of teacher)																									
P23 Requesting help (of peers)																									
P24 Waiting																									
P25 Uninvolved/Onlooker																									
P26 Off task behaviour																									
Other																									
Other																									

Appendix 4: Post-Lesson Evaluation (adapted from Ofsted, 2009)

LA: School:

Yr Gp: Date: RO:

Visit number: Practitioner::

Ofsted (2009) *Making More of Music: Improving the quality of music teaching in Primary schools*

Circle either Unsatisfactory/Satisfactory/Good /Outstanding for each of the five elements based on lesson observed

Defined a simple,clear musical focus for the work, used it to link all activities (did more of less).

Unsatisfactory Absence of the behaviours described in satisfactory

Satisfactory   The learning focus described what pupils learned – not did: e.g. 'developed performing skills' rather than 'performed together as a class'.

Tasks broadly related to the focus but opportunities were missed to help the pupils make direct links between experiences, and lessons had too many different activities.

Good   The clear learning focus identified specific skills and/or knowledge to be learned, e.g.; learn to listen to each other so that parts fit together.

Clear links were made between the different tasks by relating them back to the learning focus. As a result the same learning was reinforced and consolidated.

Outstanding   The clear learning focus identified not only the specific skills and/or knowledge to be learned but how it helped to improve the musical quality of pupils' responses; e.g. understand how correct posture and breathing helped to improve the quality of singing.

All tasks were planned so that they built progressively and accumulatively, enabling pupils not only to consolidate but also to extend their learning and enjoy a musical experience of quality.

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Comment :


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Started and finished with sound – putting the emphasis on aural development

Unsatisfactory   Absence of the behaviours described in satisfactory

Satisfactory   Pupils were given opportunities to listen carefully but their learning did not always start from sound; e.g. notation was used too early in the learning process and much of the work was based on spoken instructions and verbal response.

Good   Much of the learning arose out of what was heard so that pupils could respond musically; e.g. notations were used sensitively as a support and not as a gateway into the work and pupils were encouraged to show what they understood.

Outstanding   There was no doubt this was a music lesson – all learning grew out of what was heard; audio recordings of pupil's work were constantly used so that pupils could hear what they needed to do in order to improve their work further and could celebrate improvement; work was constantly modelled.

Comment :

Identified simple steps of progression – so pupils knew how to improve their work.

Unsatisfactory   Absence of the behaviours described in satisfactory

Satisfactory   Pupils were clear about what they were learning to do but were not always clear about how they could improve what they had done.

Good   Pupils knew what they needed to do and had 'something to aim for' so that they knew what would make an even better response and recognised achievement (beyond completing the task).

Outstanding   Pupils helped define how they could show they had got better and all knew how to improve their own and the class response – so all gained a sense of individual as well as collective achievement.

Comment :

Set high expectations; listened critically to musical responses & identified what needs improving.

Unsatisfactory   Absence of the behaviours described in satisfactory

Satisfactory   Pupils were encouraged to improve their work and some weaknesses were identified but tasks were repeated without a focus on what needed to be improved. Some overgenerous praise.

Good   Specific weaknesses were identified and there was focused improvement; pupils were challenged to improve the musical quality of their work and close analysis of why some were finding it difficult led to different approaches being explored.

Outstanding   All pupils saw themselves as musicians as a result of the high expectations for all and the constant emphasis on improving the quality of their individual responses as part of the whole experience.

Comment :

Adapted work to meet different learning needs; made use of simple ways to assess pupils' progress.

Unsatisfactory   Absence of the behaviours described in satisfactory

Satisfactory   The teacher watched how pupils responded and provided extra support and challenge where needed.

Good   Simple records of pupils' responses in relation to what was expected helped to ensure that work was adapted to meet different learning needs.

Outstanding   Expectations were raised in direct response to the progress made; simple records lead to pupils being actively involved in extra-curricular activities and extra support was given to those who needed more help to develop their musical skills.

Comment :

Appendix 5: Example of a scored transcript of the Bus Story

Info score	Transcription	Sentence length
	Once upon a time there was a little red bus	6
2	He ran away	3
2	And he had a race with a train	7
2	But the train went in a tunnel	6
2	And he just carried on	4
1	A policeman	2
2	The little red bus got tired of walking on the street	11
2	So he jumped over a fence	5
3	And he saw a cow that said MOOO	7
2	He landed in a pond	5
2	And then the driver called a [crane]	4
	and then pulled	1
	They came as soon as they could	7
2	And then they pulled the little red bus out	7
1	And then he came back	3
23		
	Av5LS	**7.8**
	Total number of words	**78**
	MLU	**5.2**