



By Peter J. Hatcher,
Fiona J. Duff and Charles Hulme



SOUND LINKAGE

*An Integrated Programme for
Overcoming Reading Difficulties*

THIRD EDITION



WILEY Blackwell

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AN INTEGRATED
PROGRAMME FOR
OVERCOMING READING
DIFFICULTIES

THIRD EDITION

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WILEY Blackwell

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FOREWORD

Many children experience difficulties in learning to read. One common form of reading difficulty, sometimes referred to as dyslexia, is a problem in ‘cracking’ the alphabetic code. In the last few decades research into the nature of dyslexia has made enormous strides and we now know a great deal about the nature and causes of these children’s reading problems. Children with dyslexia are characterised by having difficulty learning how the letters in written words map onto the speech sounds in spoken words. These problems in mastering the alphabetic principle appear to originate from problems with the representation of speech sounds (a deficit in phonological representation).

This research has led to a large body of work concerned with developing and evaluating how best to teach children with dyslexia. The work by Peter Hatcher and his colleagues has been at the forefront of work in this area. The *Sound Linkage* programme contains an easy-to-use assessment of children’s phonological awareness skills. If this shows that a child has problems acquiring these skills, the training materials in *Sound Linkage* can be used by a teacher, or well-trained teaching assistant, to help improve the child’s phonological awareness. The groundbreaking research that underlies this programme (Hatcher, Hulme & Ellis, 1994) showed that an integrated programme linking phonological awareness training with structured reading instruction was remarkably successful in helping to improve children’s reading skills. Although the materials provided here were developed with the needs of poor readers in mind, there is every reason to suppose that many other children will benefit from explicit teaching to analyse the sounds of words and to understand how these relate to their written forms. The *Sound Linkage* programme is therefore a valuable resource for all those concerned with helping children learn to read.

Sir Jim Rose CBE FRSA
Former Director of OFSTED

ABOUT THE COMPANION WEBSITE

There is a companion website for this book:

www.wiley.com/go/hatcher

The website contains the following material for you to download and use:

- Electronic versions of the Picture Sheets
- Electronic versions of the Record Sheets.

INTRODUCTION

Phonological awareness can be defined as the ability to explicitly access and manipulate the sound structure of spoken words. It is now recognised that phonological awareness is a critical component skill for learning to read. Phonological awareness is a broad term that covers different ‘levels’ or sizes of phonological units in spoken words. For example, a child may begin by developing syllable awareness first (that ‘happy’ contains two syllables) and then become aware of rhyming relationships between words (that ‘cat’ and ‘hat’ share the rime unit /at/ at the end of the syllable) before going on to develop phoneme awareness (the understanding that ‘cat’ can be split into three speech sounds, /k/ /ae/ /t/). Phoneme awareness is particularly critical for reading development (Muter, Hulme, Snowling & Stevenson, 2004).

Problems in phonological awareness are a major cause of reading problems in young children. *Sound Linkage* allows a teacher or teaching assistant (TA) to assess whether a child has adequate phonological awareness skills, and if they do not, provides materials that can be used to help teach this skill in a sequential and systematic way. However, teaching that is designed to improve phonological awareness should not take place in isolation. The name of this programme refers to the fact that there is good evidence that phonological awareness training needs to be ‘linked’ or integrated with the teaching of letter–sound knowledge and reading and spelling skills in order to improve reading. Activities that emphasise this linkage are also included in this programme.

The materials in this manual were used as part of the Reading with Phonology remedial teaching programme developed by Hatcher, Hulme and Ellis (1994). Research has shown that these materials are effective as one component of an integrated approach to teaching young children who are struggling in the early stages of learning to read. Details of the research findings associated with *Sound Linkage* are given in the ‘Sound linkage: theoretical background to the programme’ chapter, which has been updated and extended for this third edition.

The majority of this manual contains the programme of phonological and phonological linkage activities that was used in the original research study. The activities are accompanied by a set of photocopiable Record Sheets and a set of pictures. The 10 sections of phonological activities have been reordered

for the third edition, to fit with advances in research findings. These sections cover identification of words and syllables, identification and supply of rhyming words, identification and discrimination of phonemes and blending, segmentation, deletion, substitution and transposition of phonemes within words. Given the prime importance for phoneme awareness in learning to read, teachers and TAs should aim to focus their efforts here, rather than on training syllable and rhyme awareness. In addition to the extra linkage activities at the end of sections 5, 6, 7, 8 and 9, the original activities for linking sounds and letters in the context of reading and writing text are described in Section 10. The appendix of additional phonological activities may be used to help children master a particular skill or to reinforce existing learning.

It is important that the 'Programme administration' section, which contains specific details about the administration of the programme, should be read before implementing any of the activities with a child. This information immediately precedes Section 1 of the training activities.

The test of phonological awareness should be used to gauge a child's level of phonological development at the start of the programme and as an indication of where to start a child in the programme. For example, if a child demonstrates a high level of ability in working with syllables and rhymes, those sections of the programme might be omitted. Given the structure of the programme, it is possible to return to a lower level if a teacher or TA finds that they have started at too high a level. The test of phonological awareness may also be used to measure a child's progress in developing phonological awareness. Normative data for the *Sound Linkage* test are given in the 'Test development and standardisation' chapter.

In addition to the 54 Picture Sheets included with this manual, teachers and TAs must have access to a packet of six counters, a stopwatch or a watch with a second hand, a miniature car and a box of crayons.

We hope you will find these materials useful in the assessment and teaching of children with reading difficulties.

TEST OF PHONOLOGICAL AWARENESS

Aim

The *Sound Linkage* test of phonological awareness takes about 10 minutes to administer. The main aims of the test are to create a profile of a child's strengths and weaknesses in phonological awareness, and to determine a child's point of entry to the training activities. As a normative test (Hatcher, 1996), it may be used to identify young children at risk of reading failure and those children whose reading delay may be attributable to limited phonological awareness skills. Following an interval of at least three (preferably six) months, the test may be re-administered in order to provide a measure of progress in acquiring phonological awareness skills. Instructions for administering and using the test are given here; information on its development and standardisation can be found in the 'Test development and standardisation' chapter.

Testing considerations

Materials needed: five counters, administration sheets (this chapter, p. 4 to 9) and photocopiable 'Test of Phonological Awareness' Record Sheet (Record Sheet A, pp. 156–157).

Administration, scoring and discontinuation

1. Before administering the test, run through it in order to familiarise yourself with the items and how to pronounce them. For example, words are separated into syllables based on spelling (e.g. *croc* – o – *dile*), but this might not best reflect how the individual syllables are pronounced (e.g. *croc* – u – *dile*).
2. The test should be administered in a quiet room free from distractions: children need to be able to hear and to concentrate in order to respond to fine differences of sounds in words.
3. Consonants need to be kept as phonetically correct as possible. Consonants such as p, t, k, th, f, v, s, z, sh, ch, h, m and n should be pronounced without adding a vowel. 'Spot', for example, should be pronounced /s/ /p/

/o/ /t/ and not 'suh' 'puh' 'o' 'tuh'. With other consonants, b, d, g, j, w, r, l and y, the following vowel should be kept as short as possible. A one-minute video on clear pronunciation of phonemes can be found on this webpage: http://www.youtube.com/watch?v=BqhXUW_v-1s

4. Care should be taken to avoid giving children non-phonological clues, particularly in the rhyme section. It is possible to prime children as to the expected answer by a change of intonation, stress or volume or by pausing before a word. Body language, such as changing eye contact, can also give children help. For these reasons, try to present items in a smooth and even manner. Ideally, children should sit sideways to the examiner.
5. When children ask for an item to be repeated, it is permitted to do so, just once. Immediately after this, it should be explained that they must listen very carefully as the rest of the words or sounds will be said only once.
6. There is a time limit of about 10 seconds per item.
7. To prevent them failing unnecessarily, the test should be discontinued if children have failed eight consecutive items.

From testing to teaching

The areas of difficulty on the test can be used as a general guide for where to enter the training programme.

The earliest phonological skills to develop are awareness of words, syllables and rhyming relationships between words. If a child makes any errors on the syllable blending or rhyme subtests, we suggest that some time is spent on training these skills using the first three sections of the teaching programme. However, for reading development, awareness of phonemes in spoken words is the most critical skill and we suggest that teaching progresses to developing phoneme awareness as soon as possible (using sections 4 through 10).

Children who made no errors on the syllable blending or rhyme subtest, but made errors on any of the phoneme awareness subtests, should begin with phoneme awareness training. As a guide, we suggest that such children should begin the training at section 4, 'Identification and discrimination of phonemes'. Sections 4 through 10 are ordered according to their level of difficulty for most children. We would recommend that teachers use these sections flexibly, but work through these different exercises to ensure that children have a secure foundation in being able to hear phonemes in words, blend and segment phonemes, and manipulate phonemes flexibly in conjunction with letters.

Syllable blending

Say:

I am going to pretend to be a robot who can only say words in a funny way. I want you to try to guess what I am saying.

Pronounce the word 'biscuit' leaving a one-second gap between each syllable:

bis – cuit

Help the children if they cannot do it. Present the next exemplar in the same way.

di – no – saur

Say:

What do you think the robot is trying to say now? Listen carefully.

| | Correct response | |
|-----------------------|-----------------------------|--------------------------|
| | Yes | No |
| win – dow | <input type="checkbox"/> | <input type="checkbox"/> |
| croc – o – dile | <input type="checkbox"/> | <input type="checkbox"/> |
| phot – o – graph | <input type="checkbox"/> | <input type="checkbox"/> |
| tel – e – scope | <input type="checkbox"/> | <input type="checkbox"/> |
| ad – ven – ture | <input type="checkbox"/> | <input type="checkbox"/> |
| mer – ry – go – round | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |

Phoneme blending

When pronouncing phonemes, leave a one-second gap between each. Say:

The robot is now going to say some short sounds. See if you can make them into words.

t – a – p

Help children if they cannot do it.

Present the next exemplar in the same way.

d – o – g

Say:

What do you think the robot is trying to say now?

| | Correct response | |
|---------------|-----------------------------|--------------------------|
| | Yes | No |
| e – gg | <input type="checkbox"/> | <input type="checkbox"/> |
| r – ai – n | <input type="checkbox"/> | <input type="checkbox"/> |
| s – ou – p | <input type="checkbox"/> | <input type="checkbox"/> |
| d – i – s – c | <input type="checkbox"/> | <input type="checkbox"/> |
| s – t – e – p | <input type="checkbox"/> | <input type="checkbox"/> |
| s – o – f – t | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |

Rhyme

Say:

Have you heard of Hickory, dickory dock? Hickory, dickory dock, the mouse ran up the ___ [clock]? Dock and clock are different words, but they sound a bit the same. Listen. Dock, clock.

Do you know Jack and Jill? Jack and Jill went up the ___ [hill]? Jill and hill are different words, but they sound a bit the same. Jill, hill. Can you think of another word that sounds a bit like Jill?

Does 'fill' sound a bit like 'hill'? What about 'pill'? Does 'pill' sound a bit like 'hill'?

What about 'did'? Does 'did' sound like 'hill' and 'pill'?

Give the children feedback after their answers, but do not tell them to listen to rhyming sounds or to the last sound.

Say:

I am going to say three words and I want you to tell me the one that sounds the most different.

Pronounce the following with equal emphasis, at one-second intervals:

hat, fat, man

If a child got it wrong, say:

No. 'Man' was the one that sounds most different. Listen again.

hat, fat, man

Now try these:

peg, hen, beg

If a child got it wrong, say:

No. 'Hen' was the one that sounds most different. Listen again.

peg, hen, beg

Present the following sets of words and before each say:

Tell me the word that sounds most different.

| | Correct response | |
|------------------------|------------------|-----|
| | Yes | No |
| dog, pot , log | [] | [] |
| late, mate, fat | [] | [] |
| bad, cap , mad | [] | [] |
| bun , hug, mug | [] | [] |
| hill, pill, dim | [] | [] |
| net , ten, pen | [] | [] |
| Total | []/6 | |

Phoneme segmentation

Say:

Now it's your turn to talk in robot language. How do you think the robot would say 'off'?

Help the children if necessary by using two counters. Push a counter forward simultaneously with the pronunciation of each sound. If children are helped by the use of the counters, let them use them for the second example (two counters) and for the six test items. Always give the children the correct number of counters corresponding to the number of phonemes in each word (given in brackets after the word).

How do you think the robot would say 'tea'?

Help children if necessary.

Say:

You see if you can say these words just like the robot would.

| | Correct response | |
|------------------------------|-----------------------------|--------------------------|
| | Yes | No |
| pet (3, p – e – t) | <input type="checkbox"/> | <input type="checkbox"/> |
| tick (3, t – i – ck) | <input type="checkbox"/> | <input type="checkbox"/> |
| cost (4, c – o – s – t) | <input type="checkbox"/> | <input type="checkbox"/> |
| slate (4, s – l – ay – t) | <input type="checkbox"/> | <input type="checkbox"/> |
| crest (5, c – r – e – s – t) | <input type="checkbox"/> | <input type="checkbox"/> |
| jumps (5, j – u – m – p – s) | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |

Phoneme deletion

Say:

This time we are going to say a word like 'cup'. Then we will say it again, but without one of its sounds. What would the word 'cup' become without the /c/ sound? What word would you hear?

If necessary, help children by first pronouncing 'cup' and then segmenting it into its onset /c/ and rime /up/. The segmentation part of the process might be done a number of times with increasingly longer gaps between the onset and rime.

Cup, /c/ – /up/, /c/ – – /up/, /c/ – – – /up/

Say:

If we take away the /c/ sound from cup, it leaves the word 'up'. What word would be left if we took away the /m/ sound from arm?

If necessary, help children as above.

Say:

See if you can do these. What word is left if we take away the:

| | Correct response | |
|--|-----------------------------|--------------------------|
| | Yes | No |
| /g/ sound from gone? (on) | <input type="checkbox"/> | <input type="checkbox"/> |
| /k/ sound from fork? (for) | <input type="checkbox"/> | <input type="checkbox"/> |
| /s/ sound from stop? (top) | <input type="checkbox"/> | <input type="checkbox"/> |
| /t/ sound from hurt? (her) | <input type="checkbox"/> | <input type="checkbox"/> |
| /s/ sound from past? (part or pat) | <input type="checkbox"/> | <input type="checkbox"/> |
| /w/ sound from swift? (sift) | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |

Phoneme transposition

Say:

In this section we are going to say a word like 'pat'. 'Pat' has three sounds: /p/ /a/ /t/. You say them. If we say the sounds for 'pat' backwards, /t/ /a/ /p/, we get another word. What word is that?

If necessary, help by saying:

Say the sounds for 'pat' like the robot would. Now say them backwards. What word does that make? Let's try another one. What word would we get if we said the sounds for 'nip' backwards?

Help if necessary.

Say:

Let's try these. What word would we get if we said the sounds for these words backwards?

| | Correct response | |
|------------------------|-----------------------------|--------------------------|
| | Yes | No |
| net (ten) | <input type="checkbox"/> | <input type="checkbox"/> |
| pack (cap) | <input type="checkbox"/> | <input type="checkbox"/> |
| kiss (sick) | <input type="checkbox"/> | <input type="checkbox"/> |
| late (tail) | <input type="checkbox"/> | <input type="checkbox"/> |
| cheap (peach) | <input type="checkbox"/> | <input type="checkbox"/> |
| nice (sign) | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |

Spoonerisms

Say:

In this last section, we are going to say two words and listen for their beginning sounds. We will change the beginning sounds round and say two new words. For example, 'bed time' (pause) would become 'ted bime'. Listen to the steps, 'bed time', /b/ /t/, /t/ /b/, 'ted bime'.

If necessary, help by saying:

The new words do not always make sense but that does not matter. Say the beginning sounds for 'large boat'. Now change them round (pause) and say the new words [barge loat].

Help if necessary.

Say:

Let's try these. What words would we get if we changed the beginning sounds round?

| | Correct response | |
|--|------------------------------|--------------------------|
| | Yes | No |
| Kate Leigh (late key) | <input type="checkbox"/> | <input type="checkbox"/> |
| Marsha Potter (parsha motter) | <input type="checkbox"/> | <input type="checkbox"/> |
| red jug (jed rug) | <input type="checkbox"/> | <input type="checkbox"/> |
| gold coat (cold goat) | <input type="checkbox"/> | <input type="checkbox"/> |
| Jimmy Yarker (yimmy jarker) | <input type="checkbox"/> | <input type="checkbox"/> |
| General Mutters (meneral jutters) | <input type="checkbox"/> | <input type="checkbox"/> |
| Total | <input type="checkbox"/> /6 | |
| Overall total | <input type="checkbox"/> /42 | |

PROGRAMME ADMINISTRATION

PHONOLOGICAL TRAINING ACTIVITIES

The purpose of the 70 phonological awareness training activities is to help children with reading difficulties appreciate that words are made up of sounds, and that when a sound is changed it alters the meaning of a word. The activities are of a purely auditory nature. Without this ability, children are likely to experience difficulty in learning to read. This ability is not enough on its own, however. Children must also be able to make the connection between sounds and letters (Byrne & Fielding-Barnsley, 1989).

In the Reading with Phonology group, mentioned in the 'Introduction' (from the work of Hatcher, Hulme & Ellis, 1994), this linkage work was effected through the reading and writing components of the reading programme (see Section 10). It was not effected through the phonological awareness training activities. Indeed, some relationships between sounds and letters are likely to confuse children who are struggling to hear sounds in words and who are at an early stage of learning to read. (e.g. changing the /n/ sound in churn to a /p/ sound to produce chirp). Consequently, the linkage work was tailored to the attainments of individual children.

Having made those points, it is possible that some children may benefit from linkage activities after blending, segmenting, deleting and substituting sounds within spoken words. For that reason, sound linkage activities have been added at the end of each of these sections, making a total of 84 activities overall. It remains an empirical question, however, as to whether the relationship between letters and sounds follows the same developmental sequence as that for hearing sounds in words.

The phonological awareness activities are divided into nine sections ordered in terms of difficulty – from identification of words as units within sentences to phoneme manipulation. On entry to school, some children are not aware that the sentence 'Can I have a biscuit, please?' contains a number of separate words. Awareness of syllable units, as in 'bis – cuit', follows awareness of words. A child then becomes aware of the distinction between a word's first consonant(s) or onset (e.g. /c/ in 'can') and the rest of the syllable, its rime (e.g. '-an'). Finally an awareness of phonemes, the smallest sounds that can alter the meaning of a word, grows. The development from onset–rime

awareness to phoneme awareness may be mediated by the fact that the initial phoneme of a word (e.g. /c/ in 'cat') is often equivalent to its onset. Awareness of final and medial sounds in words develops later. Within this programme, the sections on phoneme manipulation are ordered from blending to segmentation, deletion, substitution and transposition. Within each section the activities vary in terms of difficulty. Given this structure, teachers and TAs should carry out the activities in the order in which they appear. However, depending upon children's success on the phonological awareness test (see the 'Test of phonological awareness' chapter), teachers and TAs may decide to omit the first few sections on words, syllables and rhyme.

Instructions

The activities and any individual reading work should be carried out in a room free from distraction: children need to be able to hear and to concentrate in order to respond to this kind of work. Given the amount of concentration required, most children can manage about 10 minutes' of isolated phonological work before they need to change activity. In order to keep a balance within a 30–35-minute integrated reading programme, no more than 10 minutes should be spent on those activities during a session.

Where necessary, the first few activities in each section are used to introduce required vocabulary. We cannot assume that a child has the language concepts required to understand our instructions. With the exception of activities that explain concepts, each activity begins with three examples, generally followed by a set of six screening items. If a child is completely successful with the screening items (without teacher or TA help), he or she should be allowed to progress to the next activity; if not, the teacher or TA can use the screening items as teaching points. In most instances, the screening items are followed by 12 further items.

The Record Sheets for the training programme are printed separately (Record Sheets A through J, pp. 156 to 184) and may be photocopied. Space is provided for teachers and TAs to record the percentage of correct responses for each activity. If a child completes an activity with less than 75 per cent success, additional work should be done on that activity. Teachers and TAs should exercise judgement, however, as to how long to persevere on a single activity. In particular, teachers and TAs should not dwell too long on syllable and rhyming activities, but aim to focus on training phoneme awareness.

In order to keep record-keeping time to a minimum, Appendix 2 (p. 148) consists of a table that allows teachers and TAs to convert fractions (for the number of correct responses out of total responses) to percentages. The Record Sheet provides teachers and TAs with advice as to whether to progress to the next section, based on the number of activities in a section completed with a 75 per cent success rate.

The programme also contains a range of easy-to-hard fun activities that can be used to provide further help in each area of phonological awareness, or to reinforce learned phonological skills. These are found in Appendix 1 (pp. 142–147).

While the programme is as user-friendly as possible, teachers and TAs should read each activity before working with a child, so that they are happy with the material and can present it in a natural way. In keeping with this, and provided that the intent of the instructions is not altered, it is not necessary to stick rigidly to the text. By reading ahead you might also be prompted to think of ways of making a game out of an activity.

Three additional points need to be borne in mind when using the programme:

1. Keep consonants as phonetically correct as possible. Consonants such as p, t, k, th, f, v, s, z, sh, ch and h should be pronounced without adding a vowel. For example, 'spot' should be pronounced 'sss' 'p' 'o' 't' and not 'suh' 'puh' 'o' 'tuh'. With other consonants, such as b, d, g, j, w, r, l and y, the following vowel should be kept as short as possible.
2. Try to avoid giving non-phonological clues when a child has to respond by choosing between two or more stimuli. It is possible to prime children by a change of intonation, stress or volume or by pausing before a word. Body language, such as changing eye contact, can also give a clue to the expected answer. For these reasons, try to present items in a smooth and even manner.
3. The sequence of concept activities at the start of some sections has been devised to introduce understanding of a concept in a series of steps. These involve discussion linked to practical activities, visual examples, auditory examples and examples linked to phonological activities. Help your children to see the progression. The goal of these activities is mastery of the concept, not to identify sounds. To avoid confusion, teachers and TAs should not refer to sounds while presenting these activities. If a child refers voluntarily to sounds, however, accept the responses as evidence that he or she is thinking about sounds.

PHONOLOGICAL LINKAGE ACTIVITIES

In addition to phonological training, the children in our study received help in making the link between sounds and letters in words. A query that might arise from our study is whether the link between reading and phonological activities needs to be made explicit. It might be argued that all that is necessary is to provide children with reading and phonological training; they will then make the connection. However, the results of a study by Byrne and Fielding-Barnsley (1989) suggest that this is not the case. Byrne and Fielding-Barnsley found that, in order for children to understand the alphabetic principle ('whenever a particular phoneme occurs in a word, and in whatever position, it can be represented by the same letter'), three components must be in place: a child must be able to isolate phonemes within words, appreciate that sounds can be common between words and know specific sounds can be represented by particular letters. The first two components are not enough: children need to be explicitly taught to make the connection between letters and sounds.

Accordingly, the phonological linkage activities employed in our study are presented after the phonological training activities, but were integrated within the reading programme. The activities included learning letter–sound associations, relating spellings to sounds using tactile letters (as advocated by Bradley & Bryant, 1985) and writing words while paying attention to letter–sound relationships. Children’s attention to these relationships was maintained during the reading part of each session. We strongly advise that in addition to working through the phonological awareness activities in Sections 1 to 9, time is spent on training phonological linkage, as per Section 10, and integrating these skills whenever practising reading and writing.