

The BKB Assessment Toolkit

Anne Wilson and Lisa Pickerill describe a new method they've been using for assessing the hearing of deaf children

The Bamford Kowal Bench (BKB) is an integral part of our assessment toolkit for hearing-impaired children across our service.

The method we have used up to now has been for ToDs to speak the sentences, monitoring their voice level with a handheld sound-level meter at a measured distance, usually 3m, from the child. Lipreading was removed by a 'high-tech method', using a piece of paper positioned in front of the mouth. This, however, could have an impact on the high frequency sounds of speech, so it is not an ideal system.

A tape positioned at the same set distance, either in front or behind the student, provided the background babble noise. Both voice intensity and background babble intensity needed to be at the same level of around 60–70dB at the student's ear, to give a signal-to-noise ratio of 0dB. This meant measuring your voice at a distance of about one metre – an arm's length – then measuring the background babble noise at the same distance and adjusting the volume of voice or babble or both.

This was not an easy task. As a teacher, the natural thing to do is to raise your voice to combat any distracting noise, so keeping the voice at a steady level was very hard.

Delivering the sentence from this distance at the correct voice level and listening to the child while scoring it did not allow you as a teacher to closely monitor the student to pick up signs of any difficulty, anxiety or other emotions that the child might show during the test. In fact, hearing exactly what the child said was often very difficult, particularly in background babble noise when the child had a quiet voice.

We have now developed the BKB DVD as part of our Service BKB Toolkit.

BKB sentence lists 1–8 have been recorded onto DVD, both with full face and with masking over the mouth to remove the child's ability to use lipreading. This format allows great flexibility in its delivery. This DVD can be played on a laptop or



desktop PC using any of the available media players. Recording it in this format frees the ToD from having to deliver it, thus allowing a greater chance to monitor the child and his or her responses.

The photograph shows the equipment ready for use by the peripatetic ToD using a laptop, which is set up with an external speaker and a CD player for the background babble noise. These are both connected to the external speaker with a two-way adaptor jack.

The volume of the BKB is controlled using the laptop/PC settings, and the CD player adjusts the volume for the babble. The laptop and speaker are set up three metres in front of the child, enabling the ToD to sit closer to the child and hear the responses more clearly and also to monitor the child more closely.

Either a remote mouse or a mouse with a long lead can control the delivery of the sentences. Each sentence can be played then paused to allow the child to respond. If the child has no difficulty with his or her responses, the list can be played without pausing, as there is enough of a time lapse between the sentences for the child to respond.



The equipment for the peripatetic ToD consists of:

- laptop
- speaker – the PAL (Portable Audio Laboratory) is not cheap but gives excellent sound quality
- two jack-to-jack leads and a two-way adaptor
- CD player
- sound-level meter.

A desktop computer will have integral speakers, so the CD player will need its own speaker.

The DVD, price £10, is available from the Service for Hearing Impaired Children, Specialist Support Services, Prince Edward Primary School, City Road, Sheffield S12 2AA. Tel and fax: 0114 2398338. Email: lisa.pickerill@sheffield.gov.uk or anne.wilson2@sheffield.gov.uk.

Revisiting the BKB Toolkit

Anne Wilson provides an update on the use of the Toolkit for testing speech discrimination



In the January 2007 edition of the BATOD Magazine I detailed the Bamford Kowal Bench (BKB) Toolkit that we have developed here in Sheffield using a DVD version of the first eight BKB sentence lists. As a result of this article and

demonstrations to various groups, including the BAEA, I am pleased to say that we have sold nearly 100 copies of the DVD to services all over the British Isles.

The DVD arrives with a handy booklet showing how we are using it in Sheffield, but I am sure that many services have adapted different methods to suit their situation and needs. It was not meant to be a strict regime but merely one method of use.

The initial idea of developing the DVD came from the research towards my Master's degree in room acoustics, and was to give consistency in the method of delivery, including using consistent and steady volume of speech and babble, to enable comparability in the monitoring of a child's speech discrimination.

My working method is to have the speech and babble coming from the same speaker in front of the student at a distance of three metres. The DVD is played through a laptop and the babble through a CD player, connected via jack-to-jack leads into an adaptor, to the speaker, both volumes being independently controlled and measured at the child's ear. The fact that the method is the same for every assessment that I do means that I have results that are comparable, so any changes in the student's results are important to note and investigate.

I work in mainstream secondary schools across the city of Sheffield with students who have hearing losses ranging from mild to severe, and I need to give information and advice to the mainstream teachers about these students. I think the most important piece of information these teachers need is how much the hearing-impaired student can hear in their classroom, and, as classrooms are never quiet, the teacher needs to be aware of the impact of background noise on the student's speech discrimination ability.

The BKB toolkit enables me to do the assessment with the student in quiet and in noise, with and without lip-reading, in a consistent manner. I request an empty classroom in which to complete this. I then leave a written report, detailing the results, for the teachers.

In the example below I tested a 13-year-old girl with a severe hearing loss first in quiet with lip-reading then in babble noise with lip-reading. These results brought home to her teachers the great difficulty she experiences in noisy situations, the red indicating the mistakes she made.

List Five

The <u>bath</u> <u>towel</u> was <u>wet</u>	-3
The <u>matches</u> <u>lie</u> on the <u>shelf</u>	___
<u>They're</u> <u>running</u> <u>past</u> the <u>house</u>	-4
The <u>train</u> had a <u>bad</u> <u>crash</u>	___
The <u>kitchen</u> <u>sink's</u> <u>empty</u>	___
A <u>boy</u> <u>fell</u> from the <u>window</u>	___
<u>She</u> <u>used</u> her <u>spoon</u>	-1
The <u>park's</u> <u>near</u> the <u>road</u>	___
The <u>cook</u> <u>cut</u> some <u>onions</u>	-1
The <u>dog</u> <u>made</u> an <u>angry</u> <u>noise</u>	-1
<u>He's</u> <u>washing</u> his <u>face</u>	-1
<u>Somebody</u> <u>took</u> the <u>money</u>	___
The <u>light</u> <u>went</u> <u>out</u>	___
<u>They</u> <u>wanted</u> some <u>potatoes</u>	___
The <u>naughty</u> <u>girl's</u> <u>shouting</u>	___
The <u>cold</u> <u>milk's</u> in a <u>jug</u>	-1
Total score	38 out of 50
% score	76%

Order of presentation			
Distance used			3
Speech	X	No speech	
Quiet	X	Noise	
Aided	X	Unaided	
Radio aid		No radio aid	X

This student does have access to a radio aid but refuses to wear it and when the same test was completed with her using the radio aid the scores in babble noise with lip-reading improved to 82%. I used this to inform the student about how much she is missing in her classes in an unsuccessful attempt to encourage her to use her radio aid. I keep trying!

Using this method to assess the effectiveness of a radio aid does require a second speaker to be set up to provide the babble noise, with the transmitter of the radio aid being placed next to the speaker providing the speech signal.

List Seven

The <u>children</u> <u>dropped</u> the <u>bag</u>	—
The <u>dog</u> <u>came</u> <u>back</u>	—
The <u>floor</u> <u>looked</u> <u>clean</u>	-3
<u>She</u> <u>found</u> her <u>purse</u>	-1
The <u>fruit</u> <u>lies</u> on the <u>ground</u>	-3
<u>Mother</u> <u>fetches</u> a <u>saucepan</u>	-3
<u>They</u> <u>washed</u> in <u>cold</u> <u>water</u>	-4
The <u>young</u> <u>people</u> are <u>dancing</u>	-3
The <u>bus</u> <u>went</u> <u>early</u>	-1
<u>They</u> <u>had</u> <u>two</u> <u>empty</u> <u>bottles</u>	-4
A <u>ball's</u> <u>bouncing</u> <u>along</u>	—
The <u>father</u> <u>forgot</u> the <u>bread</u>	-3
The <u>girl</u> has a <u>picture</u> <u>book</u>	-3
The <u>orange</u> was <u>quite</u> <u>sweet</u>	-3
<u>He's</u> <u>holding</u> his <u>nose</u>	-3
The <u>new</u> <u>road's</u> on the <u>map</u>	-3
Total score	13 out of 50
% score	26%

Order of presentation			
Distance used			3
Speech	X	No speech	
Quiet		Noise	X
Aided	X	Unaided	
Radio aid		No radio aid	X

When and why do I use the BKB Toolkit?

- I do an annual assessment generally between October and April with a report going to the SENCO at school in order to promote awareness and good classroom strategies.
- A report is written, sometimes for the annual review where there is one, or, as most of my students are not statemented, the report recommendations are included in the IEP and also in the SEN file given to all staff in school.
- The Centre for Hearing and Speech at the Sheffield Children's Hospital receives a written report to inform audiologists and consultants there about how the student is managing in school.
- I provide written information to careers advisers, college and post-16 providers.
- I provide information to the students, particularly those who refuse to wear their hearing aids, wear one only or persist in sitting at the back of the classroom.
- I will also assess when the student gets a modification to or a change of hearing aids.
- I can also reassess when the student has a heavy cold or ear infection to see the impact of these on everyday listening.

- I sometimes invite parents in to observe these assessments as it demonstrates to them also how much their child hears in various situations and emphasises the importance of consistent use of hearing aids both at home and at school.
- I use the Toolkit for INSET training for teachers in school to demonstrate the inherent difficulties of listening in background noise, usually accompanied with the use of ear defenders or plugs to simulate a mild hearing loss.
- I assess the room acoustics and the impact of factors such as reverberation time on the student's ability to hear. Using a consistent method to assess speech discrimination allows a measure to be made on the impact on listening of a long or a short reverberation time. An acoustically good classroom will enable students to hear more clearly and accurately so their scores in the BKB will be better; this supports ToDs in their requests that their students are timetabled for rooms that are proved to be acoustically good...which neatly brings me back to the initial reason for the development of this BKB DVD toolkit.

Any method of assessing speech discrimination is important to us in our roles as ToDs, particularly working in mainstream settings, and I strongly believe that this method is an easy but very effective one.

Anne Wilson is a support teacher for secondary hearing-impaired students in Sheffield and she has an additional professional interest in the effects of poor classroom acoustics on speech discrimination.

BATOD Regional meetings

October**3 BATOD East**

Deafness and Mental Health
See flyer and website for venue

7 BATOD North

Deaf Pupils with Additional Needs in
Mainstream Schools
St John's School, Boston Spa

14 BATOD Midland

Half-day conference and AGM; 12 - 5 Focus
on Literacy (preschool - secondary, Sign &
Write/Cued Speech/Phonics/IT/PSPs)
Meeting Point House, Telford Town Centre,
Shropshire

November**7 BATOD Scotland**

Conference and AGM (speaker Geoff Plant)
Glasgow

21 BATOD NI Conference and AGM

Craigavon Area Hospital

Acoustically good?

Ann Underwood describes a workshop run by Anne Wilson and Peter Grayson exploring factors that make up an acoustically beneficial classroom environment for deaf pupils

At its launch at last year's Conference, the BATOD Foundation took a brief away to look at acoustics and the effects on the educational situation of deaf children especially in mainstream classrooms. There is a wealth of empirical evidence provided by researchers about classroom acoustics but not such a great deal about what ToDs can do to improve the situation with local 'hard' evidence.

The BATOD Foundation asked Anne Wilson and Peter Grayson to explain how they make use of information that they collect about acoustics and what the deaf student hears. Previous Magazine articles written by Anne about the BKB test (January 07 and September 09) can be found in the conference folder on the BATOD website.

During the workshop Anne explained about the Sheffield work and demonstrated how to collect accurate data. In Sheffield, the room acoustics and the impact of factors such as reverberation time on the student's ability to hear are assessed. Using a consistent method to assess speech discrimination allows a measure to be made of the impact on listening of a long or a short reverberation time. An acoustically good classroom will enable students to hear more clearly and accurately so their scores in the BKB will be better; this supports ToDs in their requests that their students are timetabled for rooms that are proved to be acoustically good. Where this is not the case – in relatively poor acoustic conditions – positioning in the classroom is critical. This neatly returns us to the initial reason for the development of the BKB DVD Toolkit.

Any method of assessing speech discrimination is important to us in our roles as ToDs, particularly working in mainstream settings. Anne and Peter strongly believe, and demonstrated, that this method is an easy but very effective one.

Assembling the information

- **An annual assessment** is carried out – generally between October and April with a report going to the SENCO at school in order to promote awareness and good classroom strategies.
- **A report** is written, sometimes for the annual review where there is one, or, for students who are not statemented, the report recommendations are included in the individual education plan and also in the SEN file given to all staff in school.
- **The hospital team** is kept in the picture – in Sheffield the Centre for Hearing and Speech at the Sheffield Children's Hospital receives a written report

to inform audiologists and consultants there about how the student is managing in school.

- **Written information** is sent to careers advisers, college and post-16 providers.
- **Sharing information with the student** – the students are provided with information, particularly those who refuse to wear their hearing aids, wear one only or persist in sitting at the back of the classroom.
- **Ongoing changes** – an assessment is carried out when the student gets a modification to or a change of hearing aids. There may also be a reassessment when the student has a heavy cold or ear infection, to see the impact of these on everyday listening.
- **Including the parents** – sometimes parents are invited to observe these assessments as this demonstrates to them also how much their child hears in various situations and emphasises the importance of consistent use of hearing aids both at home and at school.
- **In-service training for mainstream teachers** – the Toolkit is used for in-service training for teachers in school to demonstrate the inherent difficulties of listening in background noise, usually accompanied with the use of ear defenders or plugs to simulate a mild hearing loss.

The BATOD Foundation is working with the manufacturers and suppliers of Soundfield Systems to organise a study day workshop on Friday 25 November at Knightsfield School. Although nothing is yet finalised it is hoped that this will look at aspects of the different Soundfield Systems, how ToDs can demonstrate the value educationally and use this information to improve the listening situation of all children but especially our deaf pupils. Watch the BATOD website for news and further details about this.

Teachers of the Deaf can be key people in ensuring that fellow professionals know about the advantages of a good listening environment in school. The campaign itself may help to generate funding, leading to increasing the use of Soundfield Systems in all schools.

BKB DVD Toolkit, price £10, is available from the Service for Hearing-Impaired Children. Contact anne.wilson2@sheffield.gov.uk or call 0114 239 8338.

Ann Underwood is a Trustee of the BATOD Foundation. Anne Wilson is a support teacher for secondary hearing-impaired students in Sheffield and Peter Grayson is an educational audiologist.