Institution: University College London

Unit of Assessment: 4 - Psychology, Psychiatry and Neuroscience

Title of case study: The Phonological Assessment Battery (PhAB) - improving diagnosis of dyslexia in children

1. Summary of the impact

Research on impairments in phonological skills underlying developmental dyslexia was instrumental in producing a major change in assessment practice for children with dyslexia, in particular for bilingual children who were previously significantly under-diagnosed. The assessment instrument developed, the Phonological Assessment Battery (PhAB), was the first such measure available to educational practitioners in the UK. Widely recommended in professional guidance, it remains the most commonly used phonological instrument by educational psychologists and teachers nationally. It has been used with nearly 38,000 children around the world in the period 2008-13 and a second edition is currently in preparation.

2. Underpinning research

A programme of research led by Professor Uta Frith at UCL during the 1990s investigated the phonological basis of developmental dyslexia, in particular with regard to dyslexia assessment and bilingual populations **[1, 2]**. Ground-breaking research with neuroimaging researcher Eraldo Paulesu (Milan) and developmental psychologist Maggie Snowling (York at that time) demonstrated that such adults show a distinctive pattern of brain activation when carrying out phonological tasks **[3]**. Connectivity between anterior and posterior language areas was found to be much weaker for them in comparison with matched controls who had shown typical reading development as children. The discovery of a neurobiological basis for dyslexia impacting on phonological processing suggested that the different manifestations of dyslexia across different languages may primarily relate to differences in the challenges for dyslexic learners of differences in the consistency of their orthographies.

Cross-linguistic studies conducted with Heinz Wimmer and Karin Landerl compared German and English children, both with dyslexia and typically developing. As predicted, the same underlying phonological processing deficit was identified in both the English and German dyslexic groups. In both cases children learning to read in English, the less consistent of the languages, performed more poorly than the children learning to read in German **[4, 5]**. This work was extended to Italian and French speaking and dyslexics. This established a universal neurophysiological basis for the underlying phonological difficulties in dyslexia while, at the same time, behavioural signs of dyslexia differed in the 3 languages. Italian dyslexic readers were able to read accurately, if slowly, but showed the same phonological processing problems as English dyslexics.

The impact of this work, as described in this case study, was crucially dependent in addition on a programme of translational research that was established alongside Professor Frith's basic research programme. A Research Seminar Group at UCL met at UCL between September 1992 and July 1995, led by Professor Frith, Professor Norah Frederickson, Director of the Educational Psychology training programme at UCL (an expert in assessment practice in educational psychology) and Dr Rea Reason of Manchester University (an educational psychologist with expertise in teaching children who have dyslexia). An invited group of researchers and practitioners was assembled with the explicit aim of translating the ongoing programme of research at UCL into practice. The other members of the Research Seminar group were: Peter Brooks (Helen Arkell Dyslexia Centre), Tim Bunn (Leicestershire LEA), Tony Cline (Educational Psychology Group, UCL), Ann Forrester (Tameside LEA), Dr Alison Gallagher (MRC Cognitive Development Unit, UCL), Simon Gibbs (Cleveland LEA), Dr Andy Miller (University of Nottingham), Diana Walton (Hackney LEA) and Jo Wilson (Buckinghamshire LEA).

In 1995 a research edition of the Phonological Assessment Battery (PhAB) was produced and an

edition of the practitioner journal Educational and Child Psychology (Volume 12, number 1), guest edited by Norah Frederickson and Rea Reason and authored by members of the Research Seminar Group, was devoted to the phonological assessment of dyslexia and the development of the five subtests which comprise PhAB. The first article by Uta Frith applied the causal modelling approach of Morton and Frith (then in press in Cicchetti & Cohen), in explaining the basic research findings and their implications for practice. In parallel to Professor Frith's basic research on dyslexia in monolinguals and bilinguals, applied research was undertaken on the use of PhAB with dyslexia and bilingual children, which was incorporated in the manual of the Standardised Edition of PhAB, which published by NFER-Nelson (now Granada Learning) in 1997, following a national standardisation by NFER.

3. References to the research

[1] Frith U, Landerl K, Frith C. Dyslexia and verbal fluency: More evidence for a phonological deficit. Dyslexia. 1995;1:2-11. Copy available on request.

[2] Gallagher A M, Laxon V, Armstrong E, Frith U. Phonological difficulties in high-functioning dyslexics. Reading and Writing. 1996;8(6):499-509. doi:10.1007/BF00577025

[3] Paulesu E, Frith U, Snowling M, Gallagher A, et al. Is developmental dyslexia a disconnection syndrome? Evidence from PET scanning. Brain: A Journal of Neurology. 1996;119(Pt 1):143-157. doi:10.1093/brain/119.1.143

[4] Landerl K, Wimmer H, Frith U. The impact of orthographic consistency on dyslexia: A German-English comparison. Cognition. 1997;63(3):315-334. doi:10.1016/S0010-0277(97)00005-X

[5] Frith U, Wimmer H, Landerl K. Differences in phonological recoding in German- and English-speaking children. Scientific Studies of Reading. 1998;2(1):31-54. doi:10.1207/s1532799xssr0201_2

[6] Frith U. Cognitive deficits in developmental disorders. Scandinavian Journal of Psychology. 1998;39:191-195. doi:10.1111/1467-9450.393078

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4. Details of the impact

The publication of PhAB had a dramatic impact on assessment practice of educational psychologists, the lead profession in the UK for assessment and diagnosis of dyslexia. Concern had been growing about traditional assessment practice which was not evidence based and led to under-identification of dyslexia in bilingual children. There was increasing awareness about the importance of phonological skills in dyslexia and PhAB provided, for the first time, a reliable and well-validated means of assessing these skills with mono-lingual and bilingual children aged 6-15 years. There was widespread adoption of the use of PhAB by educational psychologists to the benefit of the many children, particularly those from bilingual or socially disadvantaged backgrounds whose needs the traditional assessment approach failed to identify. Although other tests of phonological skills have been developed since PhAB, 10 years after its publication it was authoritatively reviewed as 'the best available test of phonological processing with UK norms' **[a]**.

In the period 2008-12[1], over *[Text removed for publication]* copies of the PhAB were sold. The total number of record forms sold (in the packs and individually) amounts to *[Text removed for publication]* record forms. One form is used per child being assessed, thus providing an indication

[1] figures up to July 2013 were not available at the time of writing

of the number of children with whom it has been used during this period **[b]**.

The most important impact of PhAB is on the children who have benefited from having their special needs identified and been able to access appropriate intervention. Undiagnosed dyslexia has been implicated in low self-esteem, poor school attendance, adjustment problems and criminal behaviour in adolescence, as well as academic failure which has lifelong consequences. PhAB provided practitioners with an assessment tool which offered significant advances over previous approaches because it was focused on the core impairments in most cases of dyslexia and informed targeted intervention to address the problems identified. It also allowed earlier identification of problems and, through being made accessible to teachers as well as educational psychologists, enabled many more children to be reached. A review in a major dyslexia textbook said: "*Both the content of the battery and the clear theoretical rationale that underpins it are impressive*" **[c]**.

From the outset PhAB was designed to be accessible to additionally trained teachers as well as educational psychologists. This has greatly extended the reach of the battery and served to maximise the numbers of children who have benefitted from the resource. In the period 2008-10, 55% of sales were made directly to schools **[a]**. A major recommendation of the 2009 Government report on identifying and teaching children and young people with dyslexia (the Rose Report) concerned teacher professional development and the need to devise tailored interventions for children struggling with literacy, including those with dyslexia. Leading professional development resources for teachers recommend the use of PhAB for use in assessments of dyslexia from which tailored interventions will be developed **[d, e, f]**. One review, published in a journal for practitioners, said: "*The battery is designed for use by EPs, speech and language therapists, support teachers and SENCOs. My experience of using this battery would suggest that all of these workers could find this a useful tool, certainly those directly involved in education. On the whole I would recommend it highly to all the above and will certainly be using it myself on a regular basis*" **[f]**.

PhAB has now become firmly embedded in educational policy across the UK and further afield. It is positively reviewed and/or recommended on the websites of many education authorities in the UK as well as at a national level in the Republic of Ireland **[h]**. It is used in at least 126 local authorities across Great Britain and Northern Ireland and during the period 2008-10 sales were recorded in 34 countries **[b]**. It is used by specialist centres that regularly assess children for dyslexia and also train many specialist teachers and assessors each year. For example the Helen Arkell Dyslexia Centre reported in 2011 "*We usually use the PhAB in our assessments when possible and encourage our trainees to do so as well*" **[i]**.

Further corroborating testimony from the Principal Educational Psychologist for the Borough of Luton (who was a member of the Executive Committee of the National Association of Principal Educational Psychologists throughout the assessment period, and was Chair 2008-10) says:

> "*Having been designed from the outset to be accessible to and interpretable by teachers, PhAB has been a very important tool in the services and support delivered to schools by educational psychologists and specialist teachers, and in the assessment practice of special educational needs coordinators in mainstream schools. While other phonological assessment tools have been published in the UK after PhAB, none of these have been as well reviewed or as highly regarded by educational psychology practitioners, and none have enjoyed the widespread implementation by teachers that has been achieved by PhAB… It is in widespread use by local authority specialist teaching services and special educational needs coordinators across the UK, and is recommended as an established and highly regarded assessment tool by educational psychologists* **[j]**."

In November 2010, more than 13 years after its publication, the publisher reported that PhAB 'continues to sell well and be used widely, particularly by specialist teachers and clinical practitioners.' It was also reported that a major North American publisher was interested in publishing PhAB for North America. A second edition of PhAB was commissioned in July 2011.

5. Sources to corroborate the impact

[a] Hurry J and Doctor E. (2007). Assessing Literacy in Children and Adolescents. Child and Adolescent Mental Health, 12(1), 38-45, p. 40. Copy available on request.

[b] Report from publisher on PhAB on sales (Available on request on a 'commercial in confidence' basis)

[c] Reid, G. (2011). Dyslexia (3rd Edition). London: Continuum SEN series. See pages 100-1 Copy of relevant pages available on request.

[d] Thompson, Michael (2009). The psychology of Dyslexia: A handbook for teachers. Chichester: Wiley Blackwell, p. 75. Copy available on request.

[e] Pavey B, Meehan M, and Davis S. (2013). The dyslexia-friendly teacher's toolkit. London: Sage, p. 40. Copy available on request.

[f] Thompson, Moira (2008) Supporting students with dyslexia in secondary school: Every class teacher's guide to removing barriers and raising attainment. London: Sage. Copy available on request.

[g] Reviews of Assessment and Intervention Tools, Educational Psychology in Practice, 16(2), 261-271. http://dx.doi.org/10.1080/02667360050122505

[h] Sample local authority websites referencing PhAB

- http://www.solihull.gov.uk/Attachments/PhAB.pdf
- http://www.moray.gov.uk/downloads/file81584.pdf
- http://www.slough.gov.uk/moderngov/(S(sc5tssz3jvpals554ayiddzl))/documents/s16586/Item%203d%20Dyslexia.pdf
- National Educational Psychology Service, Republic of Ireland http://www.education.ie/en/Schools-Colleges/Services/Educational-Psychologist-NEPS-/des_specialneedsresource_schoolcl.htm

[i] Email testimonial available from Head of Professional Training, Helen Arkell Dyslexia Centre.

[j] Copy of letter available on request. Contact details provided.