

Institution: Newcastle University		
Unit of Assessment: 26 Modern Languages and Linguistics		
Title of case study: Transforming the Clinical Practice of Speech and Language Therapists Nationally and Internationally: Assessment of Aphasia		
Period when the underpinning research was undertaken: 2000-2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Professor David Howard	Research professor	1996-2020
Dr Janet Webster	Senior Lecturer	1999-current
Dr Anne Whitworth	Senior Lecturer	1998-2011
Dr Julie Morris	Reader	1999-current
Period when the claimed impact occurred: August 2013-December 2020		
Is this case study continued from a case study submitted in 2014? N		
<p>1. Summary of the impact This research has transformed the assessment practice of Speech and Language Therapists (SLTs) working with people with aphasia (communication difficulties post-stroke) nationally and internationally. The Comprehensive Aphasia Test (CAT), developed by Howard, has become the assessment of choice for clinical use in the UK, with subsequent adaptation into 24 languages; for some countries the adapted CAT is the first aphasia assessment in that language. Via an influential textbook, written by the wider research team, SLTs and student SLTs have been equipped with the knowledge to use and interpret the CAT, facilitating their work with people with aphasia.</p>		
<p>2. Underpinning research Aphasia is a communication disorder following stroke that can affect understanding and production of spoken and written language, with wide-ranging impacts on everyday activities and peoples' wellbeing. In the UK, 100,000 people have a stroke each year and a third of those who have had a stroke have aphasia (Stroke Association, 2018). Speech and Language Therapists (SLTs) working with people with aphasia use assessments to understand the nature of the person's difficulties, consider the impact on everyday functioning and to plan appropriate intervention. Assessments need to be grounded in up-to-date theory and be accessible and time efficient to allow use in clinical practice. SLTs need to understand the theoretical rationale underpinning assessments in order to interpret results and use the findings to plan appropriate intervention. Within the management of aphasia, it is important to assess skills in the language(s) of use. For English speaking countries, there is a tradition of aphasia assessment, with a wide range of tests available. However, in some countries there are no, or a very restricted number of often poorly designed, assessments available. Comparable cross-linguistic assessment would allow results across languages to be collated for clinical and research purposes. The research discussed here has provided SLTs with an innovative clinical assessment (CAT), facilitated access to the theoretical knowledge that enables them to use the test to determine diagnosis and plan treatment and considered the contribution of formal language assessment in a clinical setting.</p> <p>The CAT (PUB 1) was developed by Howard, working in collaboration with Swinburn and Porter, who were working in the NHS at the time. The CAT was an innovation in aphasia assessment, uniquely combining language assessment based on a particular theoretical perspective (the cognitive neuropsychological approach), assessment of wider cognitive skills and consideration of the impact of aphasia on the person's everyday life. Howard led on design of sub-tests and subsequent analysis of the test's psychometric properties. The advantages of the CAT are: (i) being comprehensive, as it assesses a wide range of language and cognitive impairments and</p>		

the effect of the language impairment from the patient's perspective; (ii) being clinically useful because it is brief; (iii) being able to monitor recovery and outcome; and (iv) being psychometrically well constructed. CAT reports crucial psychometric properties including inter-tester reliability, test/re-test reliability, construct validity, predictive and concurrent reliability (**PUBS 2 & 3**). Well-constructed assessments report this data, enabling the user to be confident about the interpretation and scope of the tool.

Whitworth, Webster and Howard identified the need to support SLTs to be able to access and apply research to clinical practice, producing the first edition of their bestselling textbook on aphasia in 2005. The second edition was published in 2014 (**PUB 4**) and was revised primarily to include reference to the CAT. The book provides an introduction to the cognitive neuropsychological approach, guiding clinicians through the choice of assessments and their interpretation and treatment options. Howard's research was fundamental to the development of the cognitive neuropsychological model and this is reflected in the introductory chapters. Within the book, the authors provide expository summaries that synthesise findings and the issues to be considered. Whilst drawing together treatment studies across a range of researchers, the book includes a high proportion written by researchers based at Newcastle University (Morris, Howard, Webster and Whitworth), (2 out of 8 studies on auditory comprehension, 9 out of 29 studies on noun retrieval, 2 out of 13 studies on verb retrieval); these intervention studies were all originally published in peer reviewed journals.

As researchers, we need to consider the clinical use of aphasia assessments to understand the impact of current tests and to guide the development of future measures. In a recent International survey, Morris and Webster investigated the role of formal language assessments (**PUB 5**). Clinicians reported using a combination of informal and formal assessment, with CAT playing a valuable role in diagnosis, goal setting, planning of treatment and evaluating outcome.

3. References to the research

PUB 1. Swinburn, K., Porter, G. & Howard, D. (2004) *The Comprehensive Aphasia Test*. Hove: Psychology Press. Copy available from HEI on request.

PUB 2. Howard, D., Swinburn, K., & Porter, G. (2010) Putting the CAT out: What the Comprehensive Aphasia Test has to offer. *Aphasiology*, 24(1): 56-74. DOI:10.1080/02687030802453202

PUB 3. Howard, D., Swinburn, K., & Porter, G. (2010) The CAT is now out: A response to the commentaries. *Aphasiology*, 24(1): 94-98. DOI:10.1080/02687030802453368

PUB 4. Whitworth, A., Webster, J., & Howard, D. (2014). *A Cognitive Neuropsychological Approach to Assessment and Intervention in Aphasia: A Clinician's Guide*. (2nd edition). London: Psychology Press. Copy available from HEI on request.

PUB 5. Morris, J., & Webster, J. (2018). Language assessment in aphasia: An international survey of practice. *Aphasiology*, 32(sup1), 149-151. DOI:10.1080/02687038.2018.1485846

CAT, whilst used clinically, is also the assessment of choice in research and for clinical trials internationally, with 515 citations in research articles. Articles (PUB 2, 3 & 5) were published following the rigorous peer review process standard for the journal. *Aphasiology* is the journal of choice for both academic and practising aphasia specialists. PUB 2 is the fourth most read article in the [journal](#) (accessed 10 January 2021). Chris Code, editor of *Aphasiology* described the book (PUB 4) as 'unique, focusing as it does on the therapeutic application of principled clinical research findings'. Like the CAT, the book has become a reference point for further research into aphasia, with 250 citations of the second edition.

4. Details of the impact

This research has transformed the assessment practice of SLTs in the UK and internationally. It has equipped SLTs and student SLTs (the next generation of therapists) with the knowledge they need to use a theoretically guided approach to assessment, promoting accurate diagnosis and the planning of effective treatment.

Use of CAT by Speech and Language Therapists CAT (English language version) is sold as a standalone product. Even though there is a restricted market for tests such as these and it is common practice for clinical departments to buy only one copy of a test for use across multiple clinicians/settings, CAT has sold 1,339 copies worldwide since August 2013 (2,966 copies since publication), with sales in the UK (1,894), the US (439), Australasia & Pacific (327), Ireland (188), Asia (41) and Europe (40) (**IMP1**). The continued sales of the test and the scoresheets (2,321 packs of 10 since August 2013) emphasise that CAT is a cornerstone of clinical practice. The widespread use of CAT in the English-speaking world (**IMP2**) made it a candidate for adaptation into other languages.

Cross-Linguistic Adaptation and Use of CAT

CAT's significance for clinical practice and value to practitioners is emphasised by its translation and/or adaptation to other languages. It has been adapted for and published in Arabic (2013), Dutch (2014) and Danish (2017) (**IMP3**). In an interview where written responses were provided, authors of the Danish version state that they chose to adapt the CAT following a comprehensive review of tests available in Denmark, recognising the limited availability of standardised tests, the psychometric strengths of CAT and the inclusion of the cognitive screen and client self-evaluation (**IMP4**). It was recognised that 'there were no Danish aphasia tests available that investigate aphasia from the point of view of cognitive neuropsychology' (**IMP4**). The results of on-line surveys to clinicians working in Denmark (64 respondents) (**IMP5**) and Holland (26 respondents) (**IMP6**) show that the adaptations of CAT are being used extensively, with over 80% (Danish) and 92% (Dutch) respondents using the test in part or in full. Two thirds of respondents felt the CAT had benefited their work with people with aphasia. When asked to consider the benefits for the people with aphasia, respondents highlighted the planning of better/more targeted intervention, as well as allowing the patient to gain insight into their difficulties (**IMP5, IMP6**).

Significantly, CAT is now being adapted into a range of other languages via the work of the [Collaboration of Aphasia Trialists](#), an Erasmus Collaborative Research Network. The Collaboration is an international network of multidisciplinary aphasia researchers which aims to enhance aphasia research knowledge, skills, methodologies and infrastructure. Scientific analysis of CAT (**IMP2**) showed that it met the criteria for a cross-linguistic tool, making it the language test of choice for adaptation. These criteria included being comprehensive, relatively short, clinically relevant in informing further assessment and treatment approaches and user-friendly (**IMP2**). When established in 2014, the Assessment and Outcomes Working Group of the Aphasia Trialists focused on adaptation of the CAT into 12 languages (Basque, Catalan, Croatian, Cypriot Greek, French, Greek, Hungarian, Norwegian, Serbian, Spanish, Swedish, Turkish), of which some (e.g. Croatian, Cypriot Greek) have no assessment tools available and no diagnostic tradition for aphasia in place (**IMP2**). Cross linguistic adaptations provide clinicians with robust means to assess people with aphasia, at times when no assessment existed before, including a summary of the person's linguistic abilities and impairments and a means of monitoring recovery and measuring outcome (**IMP2**). By January 2020, the project had expanded with an additional nine languages now included in the CAT adaptation project (Finnish, German, Lithuanian, Portuguese, Irish, Italian, Russian, Slovenian, Moroccan Arabic, Punjabi) (**IMP7, Snapshot of website from 31 January 2020**). There is no other aphasia assessment that exists in this many languages, allowing comparison of results across languages for clinical and research purposes. The Assessment and Outcomes Working Group are now also adapting several assessments focusing on the psychosocial impact of aphasia; this work, now encompassing 26 languages, would not have progressed without the trailblazing work on the adaptation of CAT (**IMP7, Snapshot of website from 26 September 2020**).

Enhancing the Knowledge of Qualified and Student Speech and Language Therapists

As with the clinical tests, there is a limited market for textbooks about aphasia. The first 2005 edition of *A Cognitive Neuropsychological Approach to Assessment and Intervention in Aphasia* sold 5,553 copies worldwide. The second edition published in 2014 has sold 2,476 copies (2,145 paperback, 135 hardback and 208 electronic books) with primary sales of hard copies in the UK (1,216), US (293), Australasia & Pacific (367), Ireland (14), Europe (232), Asia (101) and the

Middle East (45) indicating significant reach (**IMP1**). The second edition is ensuring the next generation of SLTs are familiar with CAT and have the theoretical understanding to use it. Lyndsey Nickels, an eminent aphasia researcher in Australia, described the book as 'essential reading for students and an invaluable reference for clinicians'. The book has been translated into Japanese (published 2015) and Chinese (published 2016) (**IMP8**).

Surveys in 2019 to the universities with pre-registration SLT courses (**IMP9**) and to student SLTs (**IMP10**) in the UK (14 universities), Ireland (4) and Australia (18) highlighted the significance of the CAT and the book in student learning. A total of 19 universities and 151 students responded. 84% of the universities reported that students were explicitly taught about CAT (**IMP9**) and 90% of students were familiar with CAT. The Whitworth et al. (2014) book was a recommended text in 84% of the universities, making it the most popular aphasia textbook (**IMP9**). 80% of students were familiar with the book, with 59% using it frequently to support their learning; this made it the most frequently used aphasia textbook in the three countries surveyed (**IMP10**).

Students who were familiar with the book were given the opportunity to provide qualitative comments about how it had contributed to their learning. Students commented on the link between the book and their teaching on aphasia e.g. *'main text book for relevant areas of the course - required reading for every lecture'* and its value in supporting their learning e.g. *'brilliant resource to aid the assessment & intervention processes in relation to the cog neuro model - I have found this text highly beneficial as a resource to support my understanding of lecture topics and content (and to clarify some areas of uncertainty), for exam revision, and across both aphasia placements as a 'quick guide' to make sure that I'm 'on the right track' in my approach to assessment and/or intervention.'* One student commented *'this book is like the bible! it is so helpful when considering aphasia and is my go to book for looking at diagnosis and also therapy planning and management'*. (**IMP10**).

This evidence has demonstrated the global impact of this research for speech and language therapists working with people with aphasia.

5. Sources to corroborate the impact

IMP1: Sales figures from Psychology Press for CAT and A Cognitive Neuropsychological Approach to Assessment and Intervention in Aphasia: A Clinician's Guide (summary email)

IMP2: Fyndanis, V. et al. (2017). Cross-linguistic adaptations of the Comprehensive Aphasia test: challenges and solutions. *Clinical linguistics & phonetics*, 31(7-9), 697-710.

IMP3: Publication details of the Qatar/Gulf Arabic, Danish and Dutch versions of the CAT.

IMP4: Written responses to interview questions given to authors of Danish adaptation of CAT.

IMP5: Summary of results from survey to Danish speech and language therapists about use of CAT adaptations.

IMP6: Summary of results from survey to Dutch speech and language therapists about use of CAT adaptations.

IMP7: Snapshots of website from Collaboration of Aphasia Trialists Assessment and Outcomes Working Group from January 2020 and September 2020.

IMP8: Publication details of the Chinese and Japanese translations of the book.

IMP9: Summary of results from survey to staff at HEIs who host training courses for students training to be Speech and Language Therapists in UK, Ireland and Australia (36 universities).

IMP10: Summary of results from survey to students training to be Speech and Language Therapists. The survey was sent to the 36 HEIs in UK, Ireland and Australia who offer pre-registration programmes for circulation