Roberts, DJ, Owen-Booth, B and Tainturier, M

How strong is the relationship between general phonological processes and pseudo-word reading? (51st Academy of Aphasia Proceedings)

Available online at www.sciencedirect.com
ScienceDirect
Procedia - Social and Behavioral Sciences 00 (2010) 000–000
Procedia Social and Behavioral Sciences
www.elsevier.com/locate/procedia

Academy of Aphasia 2013

How strong is the relationship between general phonological processes and pseudo-word reading?

Roberts D.*, Owen-Booth B., Tainturier M.

Bangor University, United Kingdom

Background

Phonological dyslexia (PD) is an acquired reading disorder characterised by an abnormally strong lexicality effect, i.e., with impaired pseudo-word reading contrasting with relatively preserved real word reading (Beauvois & Derouesne, 1979). Parallel distributed models of reading aloud (Harm & Seidenberg, 2001) have made the strong claim that PD is due to a general, non-reading specific deficit to central phonological representations which manifests during pseudo-word reading due to the inherently high demands they place on the phonological system. Under this account, patients with impaired phonology should show impaired pseudo-word reading and vice-versa. Consistent with this view, phonological deficits frequently co-occur with PD (Friedman, 1996). In contrast, dual-route models posit that PD may result from a deficit to grapheme-phoneme conversion processes (sublexical reading process) that does not have to implicate a general phonological deficit. We present two cases that directly challenge the phonological deficit view.

Method

We present two patients who fall at opposite ends of mild-severe phonological impairment in spoken language tasks: CWS, a 58-year-old right-handed male, 15-years post stroke and KJ, a 44-year-old right-handed female, 1-year post stroke who was referred with severe phonological impairment. Both patients had normal scores on semantic tasks and CWS was moderately anomic. Both patients completed a range of phonological and reading tasks which are the focus of this report.

Results

Results are summarised in Table 1. First, it can be seen that CWS exhibits normal performance on both implicit and explicit phonological tasks. In contrast, KJ is clearly impaired on all phonological tasks. According to the phonological deficit view, KJ should also show impaired pseudo-word reading while CWS should not. However, the results are strikingly opposite to this prediction. CWS was severely impaired for pseudo-word while within the normal range in word reading ($\chi2(1)=26.18$, $P<.0001$) and committed lexicalisation errors, denoting a sublexical deficit (PD). The opposite pattern was observed in KJ, who exhibited an impaired ability to read irregular words in relation to both regular words ($\chi2(1)=8.89$, $P<.005$) and pseudo-words ($P<.05$). Consistent with this "surface dyslexia" pattern, KJ was also more impaired with low frequency words ($\chi2\ (1)=5.93$, $p<.01$) and produced regularisation errors (e.g., "mow" read to rhyme with "now").

* Corresponding author.
E-mail address: d.roberts@bangor.ac.uk .

Table 1. Performance on phonological and reading tasks

	CWS	KJ
Phonology		
Rhyme judgement	95%	**88%**
PALPA 2: Minimal pairs	97%	**86%**
Segmentation	96%	**80%**
Word repetion	99%	**57%**
Nonword repetition	95%	**45%**
*Rhyme production**		**50%**
*Syllable judgement**		**50%**
*Consonant deletion**		**50%**
*Rhyme odd one out**		**13%**
Speech errors	No	**Yes**
Reading		
Regularity		
Regular	100%	98%
Irregular	96%	**84%**
Lexicality		
Words	99%	95%
Nonwords	**35%**	93%
Reading Errors	Lexicalisation & Omission	Regularisation

Note. **Bold** denotes abnormal performance.
*Patterson & Marcel (1992).

Conclusion

These results do not support the phonological deficit hypothesis. Contrary to its predictions, the patient with a central phonological deficit (KJ) did not have impaired pseudo-word reading while the patient without a phonological deficit did have PD. This unexpected double dissociation, which has not been reported before, demonstrates that a generalised phonological impairment does not necessarily co-occur with non-word reading deficits. Although we are not refuting that phonological impairment and PD often co-occurs, our results suggest that they are not obligatorily linked.

References

Beauvois,M.F., and Derouesne,J. (1979). Phonological alexia: three dissociations. J Neurol Neurosurg Psychiatry 42(12): 1115-1124.

Friedman, R.B. (1996). Recovery from deep alexia to phonological alexia: Points on a continuum. Brain and Language 52(1): 114-128.

Harm, M.W. and Seidenberg, M.S. (2001). Are there orthographic impairments in phonological dyslexia? Cognitive Neuropsychology 18(1): 71-92.