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Strategic effects on pseudohomophone reading in phonological dyslexics with and without phonological impairment

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ABSTRACT

The literature concerning reading in acquired phonological dyslexia is conflicted with regard to performance with pseudohomophones (e.g. SKOOL). While some cases are more accurate in pronouncing non-words that sound like known words than those that do not, other cases show no pseudohomophone advantage. Some cases are more successful when pseudohomophones are orthographically similar to their base words (SKOOL versus KLOO); other cases show no visual similarity effects. We collected data from two phonological dyslexics in order to examine whether pseudohomophone reading was influenced by a) the presence of a generalised phonological impairment b) whether pseudohomophones appeared alone or intermixed with non-words and c) whether the phonological dyslexic was told that pseudohomophones were included among the stimuli. Results showed that patterns of reading accuracy were different in cases with and without phonological impairment, and that altering the presentation context or providing explicit instruction affected the responses. The findings are discussed in relation to models of word reading.

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1. Introduction

The normal reading system not only allows for the pronunciation of known familiar words, but also enables the reader to generate pronunciations for unfamiliar and for non-words. However, in some patients with brain damage and acquired dyslexia the reading system has been compromised such that the processing of the latter types of written stimuli becomes inaccurate referred to as "acquired phonological dyslexia (PD)". For example, Beauvois and Derouesne (1979) reported the case of RG, who was able to read aloud nouns without error, but only generated appropriate pronunciations for non-words in 10% of trials. Since this first published report, the neuropsychological literature has documented a number of other PD cases (see Tree, 2008 for a review) sometimes with co-occurring deficits of function word reading (e.g. KT, Patterson, Suzuki, & Wydell, 1996 versus WE, Berndt, Haendiges, Mitchum, & Wayland, 1996) and poor non-word repetition (e.g., Friedman, 1995) with this latter pattern being argued to reflect the possibility that PD is in fact a symptom of a more 'generalised' phonological deficit (Harm & Seidenberg, 2001). However, despite many reports of PD cases – few have taken into account the fact that non-words can vary in their similarity to actual words. The nature of the English language is such that the same phoneme can often be represented by different letter combinations. It is therefore possible to create stimuli that may be pronounced in the same way as existing words (e.g. BRANE sounds like BRAIN) but do not have any meaning in and of themselves. These are referred to as *pseudohomophones.*

Pseudohomophones are particularly interesting in the context of acquired phonological dyslexia as they combine characteristics of stimuli that patients fail to read (their non-word orthography) with characteristics of stimuli that are preserved (their word-like phonology). As a consequence, it might be expected that the familiar phonology linked to pseudohomophone items might 'boost' performance with these items as compared to other nonwords with no such familiarity, and indeed some early reports of PD cases indicated that this was the case (see Derouesne & Beauvois, 1985; Patterson, 1982), but not always (see Funnell, 1983). We conducted a literature review and identified 24 cases of acquired phonological dyslexia in which pseudohomophone reading was explicitly assessed. The findings are

Table 1
Word, non-word and pseudohomophone reading accuracy (% correct) for 24 published cases of acquired phonological dyslexia.

Case	Authors	Word reading	Non-word reading	PSH advantage?	Similarity effect?
AM	Patterson (1982)	94	8	Yes	Yes
LB	Derouesne and Beauvois (1985)	95	48	Yes	Yes
NJ	Nickels et al. (2008)	76	0	Yes	Yes
GSW	Nickels et al. (2008)	90+	7	Yes	No
RG	Derouesne and Beauvois (1979)	100	25	Yes	No
TY	Sasanuma, Ito, Patterson, and Ito (1996)	99	40	Yes	N/A
AD	Cuetos, Valle-Arroyo, and Suarez (1996)	89	35	Yes (trend)	N/A
KT	Patterson et al. (1996)	91	0	Yes	N/A
BK	Berndt et al. (1996)	98	40	Yes	N/A
BBO	Patterson and Marcel (1992)	90+	33	Yes	N/A
RTI	Patterson and Marcel (1992)	90+	30	Yes	N/A
TWA	Patterson and Marcel (1992)	90+	17	Yes	N/A
HC	Berndt et al. (1996)	90	12	Yes	N/A
DPR	Patterson and Marcel (1992)	90+	10	Yes	N/A
JD	Berndt et al. (1996)	90	8	Yes	N/A
CJ	Patterson (2000)	95	21	No	N/A
AN	Goodall and Phillips (1995)	85	30	No	N/A
MV	Bub, Black, Howell, and Kertesz (1987)	88	42	No	N/A
WBA	Patterson and Marcel (1992)	90+	77	No	N/A
WE	Berndt et al. (1996)	99	65	No	N/A
MC	Tainturier and Rapp (2003)	100	56	No	N/A
JH(a)	Berndt et al. (1996)	98	42	No	N/A
WB	Funnell (1983)	93	0	No	N/A
JH(b)	Nickels et al. (2008)	100	52	No	No

Note: PSH = pseudohomophone. Similarity effect refers to better reading of orthographically similar vs dissimilar pseudohomophones.