Introduction

Phonological dyslexia (PD) is an acquired reading disorder operationally defined as a dissociation between word and non-word reading. This effect can arise at multiple levels: as a damage to the grapheme-to-phoneme conversion procedure (classical PD), as a deficit of the phonological output buffer (Bisiacchi et al., 1989) and potentially as an early peripheral deficit. According to Friedman (1995), the impairment in non-word reading is always associated with sensitivity to word semantic properties, which follows a progression of symptoms along a continuum between phonological and deep dyslexia (grammatical class effect → imageability effect → semantic paralexia).

Methods

Aim of the present study is to investigate the aforementioned predictions in a group of dyslexic patients (n=50) who were classified as suffering from PD according to the procedure described by Toraldo et al. (2006). The reading ability of all aphasic participants was tested by means of a reading task containing 30 concrete nouns (15 identifying natural objects and 15 artificial objects), 15 abstract nouns, 16 function words and 15 non-words and an additional list of 40 trisyllabic words with unpredictable stress position. Participants were also tested for their ability to repeat word and non-words. Reading data were analyzed by means of logistic regression, first considering the whole group of PD patients (adopting a mixed model approach), and secondly in a multiple-single-case design.

Results

The group analysis (see Table) revealed a significant effect of both imageability (concrete better than abstract nouns: p<.001) and word length (p<.001), with no effect of grammatical class (concrete nouns vs. function words: n.s.). However, the single-subjects analysis (see Table) pointed out that most patients (n=32) do not show either imageability or grammatical class effects, 8 show both effects, whereas an effect of either imageability or grammatical class arose in 6 and 4 patients respectively. Repetition data revealed the association of non-word reading impairment with poor performance on non-word repetition for 28 patients. Some patients with impaired non-word repetition also showed imageability (5) or grammatical class (3) or both (4) effects.

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Table 1.
Results of the multiple-single-case analysis. The Table illustrates the distribution of the lexical effects (imageability and grammatical class) within the whole sample of phonological dyslectic patients and within the two subgroups based on their ability to repeat non-words (NW).

<table>
<thead>
<tr>
<th></th>
<th>Patients with impaired NW repetition (n=28)</th>
<th>Patients with good NW repetition (n=22)</th>
<th>All patients (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>None</td>
<td>16</td>
<td>57</td>
<td>16</td>
</tr>
<tr>
<td>Only imageability</td>
<td>5</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Only grammatical class</td>
<td>3</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Both</td>
<td>4</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28</td>
<td>100</td>
<td>22</td>
</tr>
</tbody>
</table>

Discussion

Data are in line with the existence of different subtypes of PD. Indeed, lexical effects can be found both in phonological buffer deficits (Shallice et al., 2000) and in peripheral reading impairments (e.g. Aggujaro et al., 2005). However, the present results are in contrast with Friedman’s prediction of an effect of imageability always co-occurring with impaired reading of function words. In addition, the finding of many cases suffering from poor non-word reading in absence of grammatical class effect (see also Tree, 2008) is in contrast with the two profiles of PD predicted by Friedman’s model. Data are therefore interpreted in light of a dual-route model of reading.

References


