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Reading strategies of good and poor readers of German with different spelling abilities

Melanie Gangl [a], Kristina Moll [b], Chiara Banfi [a], Stefan Huber [c], Gerd Schulte-Körne [b], Karin Landerl [a,*]

[a] Institute of Psychology, University of Graz, 8010 Graz, Austria
[b] Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy, University Hospital, LMU Munich, 80336 Munich, Germany
[c] Knowledge Media Research Center, 72076 Tübingen, Germany

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ABSTRACT

Reading and spelling abilities are thought to be highly correlated during development, and orthographic knowledge is assumed to underpin both literacy skills. Interestingly, recent studies showed that reading and spelling skills can also dissociate. The current study investigated whether spelling skills (indicating orthographic knowledge) are associated with the application of orthographic strategies during reading. We examined eye movements of 137 third- and fourth-graders who were either good or poor readers with or without a spelling deficit: 43 children with typical reading and spelling skills, 28 with isolated spelling deficits, 28 with isolated reading deficits, and 38 with combined reading and spelling deficits. Although we expected to find reduced reliance on orthographic reading processes among poor spellers, this was evident for the group with combined deficits only. Both isolated deficit groups applied sublexical and lexical processes in a similar amount to typically developing children. Our findings suggest that reading rests on orthographic strategies even if lexical representations are poor as indicated by a deficit in spelling skills. Findings also show that dysfluent reading does not result only from overreliance on decoding.

Abbreviations: TD, typically developing children; SD, children with isolated spelling deficits; RD, children with isolated reading deficits; RSD, children with combined reading and spelling deficits; PA, phonological awareness; RAN, rapid automatized naming.

* Corresponding author.
E-mail address: karin.landerl@uni-graz.at (K. Landerl).

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Introduction

The importance of word-specific orthographic knowledge for spelling is beyond question because the precise letter sequence of a word must be fully recalled. However, word-specific orthographic representations are crucial not only for spelling but also for accurate and fluent reading (Ehri, 1992, 2005; Share, 1995). Thus, word-specific orthographic knowledge contributes to both spelling and reading (Conrad, Harris, & Williams, 2013; Rothe, Cornell, Ise, & Schulte-Körne, 2015). Moreover, findings from cognitive behavioral studies (Angelelli, Marinelli, & Zoccolotti, 2010; Burt & Tate, 2002; Monsell, 1987) as well as from neuroimaging research (Purcell, Jiang, & Eden, 2017; Rapp & Dufor, 2011; Rapp & Lipka, 2011) favor the view of a single orthographic lexicon (e.g., Behrmann & Bub, 1992) over independent lexica (e.g., Weekes, 1996) for reading and spelling. Thus, reading and spelling are supposed to share the same orthographic representations rather than relying on different orthographic representations (for reviews, see Jones & Rawson, 2016; Purcell et al., 2017).[1] In line with this view, reading and spelling skills were reported to be highly correlated (Swanson, Trainin, Necoechea, & Hammill, 2003) and reading deficits were found to be often accompanied by spelling deficits (Angelelli, Judica, Spinelli, Zoccolotti, & Luzzatti, 2004; Landerl & Moll, 2010; Moll, Kunze, Neuhoff, Bruder, & Schulte-Körne, 2014).

The pivotal role of orthographic representations for reading is also stated by the lexical quality hypothesis (Perfetti, 2007; Perfetti & Hart, 2001). According to this theory, skilled reading builds on high-quality representations integrating knowledge about a word's phonological, orthographic, and semantic characteristics. In support of this view, reading speed was found to be affected by the quality (i.e., accuracy and stability) of orthographic representations, as indicated by spelling performance (Martin-Chang, Ouellette, & Madden, 2014; Ouellette, Martin-Chang, & Rossi, 2017). However, reading is thought to be easier and to involve less processing than spelling because in most alphabetic orthographies grapheme–phoneme correspondences are more consistent than phoneme–grapheme correspondences (Bosman & Van Orden, 1997). Furthermore, spelling requires retrieving the complete letter array from mind, whereas for reading recognition of printed letter strings is sufficient (Perfetti, 1997). Hence, spelling may require more precise orthographic representations than reading (Perfetti, 1992). Accordingly, isolated deficits in spelling in spite of adequate reading skills are generally acknowledged (ICD-10 [*International Classification of Diseases*–10th Revision]; World Health Organization, 2000). Interestingly, however, several studies across different languages reported dissociations in both directions: spelling deficits despite adequate reading skills as well as reading fluency deficits despite adequate spelling skills (Bar-Kochva & Amiel, 2016; Fayol, Zorman & Lété, 2009; Manolitsis & Georgiou, 2015; Moll, Kunze, et al., 2014; Moll & Landerl, 2009; Torppa, Georgiou, Niemi, Lerkkanen, & Poikkeus, 2017; Wimmer & Mayringer, 2002). Furthermore, different cognitive constructs were found to underpin spelling and reading fluency; whereas phonological awareness (PA; the ability to segment and manipulate speech sounds; Vellutino, Fletcher, Snowling, & Scanlon, 2004), is more strongly related to spelling, rapid automatized naming (RAN; the ability to quickly name aloud visual material; Denckla & Rudel, 1976) is more strongly linked to reading fluency (Furnes & Samuelsson, 2011; Moll, Ramus, et al., 2014; Vaessen & Blomert, 2013).

Assuming that reading and spelling rely on the very same word-specific orthographic representations, the existence of marked dissociations between reading and spelling skills is not obvious. Investigating such dissociations provides an excellent opportunity to gain important insights into the role of orthographic knowledge during reading. For isolated spelling deficits, two explanations have been suggested; both assume that individuals with isolated deficits in spelling have problems in building up well-specified orthographic representations, but they differ in their explanation as to how this deficit is compensated for in reading. Frith (1980) argued that underspecified representations are sufficient to recognize words during reading even if they are not exact enough for spelling. Based on that, Frith assumed that isolated poor spellers rely on a partial cue reading strategy, that is, reading words by sight based on degraded orthographic representations without considering the exact letter-by-letter structure. In line with this interpretation, isolated poor spellers showed good performance when read-

[1] Note that Jones and Rawson (2016) addressed another possible account of separate-but-shared lexica for reading and spelling. However, because the results were inconsistent within the study, in the current study we acted on the evidence-based view of a single lexicon for reading and spelling.