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an individual differences approach

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The relation between implicit learning and spelling ability in adults: an individual differences approach

Keywords: (A)SRT, visual statistical learning, spelling, individual differences

The ability to implicitly detect statistical regularities in orthography has been hypothesized to partly subserve spelling ability [1]. The theorized relationship between implicit learning and spelling has been substantiated by findings that the degree of success in artificial orthographic rule learning correlates with English and Spanish spelling ability [2; 3]. Implicit non-orthographic sequence learning, as tested with an alternating serial reaction time (ASRT) task, also correlates with English spelling [4]. Despite these promising findings, the link between implicit learning and spelling ability is not fully understood. Outstanding questions are 1) whether implicit learning of non-orthographic sequences, as measured by the serial reaction time (SRT) and visual statistical learning (VSL) task, is associated with spelling and 2) whether the relation between spelling and implicit non-orthographic learning is also visible in a semi-transparent orthography like Dutch.

This study addresses these issues by investigating the relation between Dutch spelling and implicit learning. We administered three implicit learning tasks in two experiments: a version of the SRT task [5], an ASRT task, and a VSL task [6]. Twenty-five adult participants (age 18 – 55 years) performed the SRT, the ASRT and a spelling task comprising real Dutch words and nonwords. The results showed significant correlations between real word spelling and both the SRT ($r = .48, p = .015$) and ASRT ($r = .40, p = .045$). Another twenty-eight Dutch native speakers (age 21 – 35 years) completed the VSL and spelling task. The VSL results correlated significantly with spelling (both real words and nonwords, $r = .53, p = .004$). The outcomes of the combined studies underline the association between spelling and implicit learning. The results furthermore show that spelling ability is associated with implicit learning of sequences tested in three different paradigms, varying in complexity (first-order (SRT) versus second-order sequences (ASRT)) and nature (visuo-motoric versus visual statistical learning). Finally they confirm that this relationship also exists in a semi-transparent orthography.

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