

**Cognitive processes in Second Language Acquisition:**  
**The role of noticing, attention and awareness in processing words in written L2 input.**

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This Ph.D. dissertation focuses on the construct of 'noticing' in Second Language Acquisition Research (SLAR) and on ways of capturing 'noticing events' that involve unfamiliar words in written second-language (L2) texts. A key concept in the Second Language Acquisition (SLA) literature, noticing denotes the cognitive process of *paying attention to* and *becoming aware of* a (typically new) language form in the input, such as an unfamiliar word or an unknown irregular verb form (p. 3). The presumably crucial role of noticing for SLA is at the heart of Schmidt's Noticing Hypothesis, which states that noticing is the "necessary and sufficient condition for the conversion of input to intake" (Schmidt, 1990: 129). Furthermore, given the hybrid nature of noticing as a process that combines (a certain quality of) attention and (a certain level) of awareness, we argue that empirical studies of noticing in SLA must be clear in whether primary evidence is sought at the level of attention ('noticing as attention') or at the level of awareness ('noticing as awareness'; chapters 1 and 3).

Prior to this dissertation, the role of noticing in SLA had been investigated almost exclusively with respect to the construct of noticing as awareness, with much less attention to noticing as attention (chapter 3). While previous research has been productive and illuminating, each method has its drawbacks. In particular, verbal reports have been criticised for both non-veridicality (when gathered offline) and reactivity (when gathered online). By contrast, eye-tracking data — justified by the eye-mind assumption (the assumption that overt attention and covert attention are tightly linked; Reichle, Pollatsek & Rayner, 2006) — have not been brought to bear on these problems until now (chapter 3).

After the potential of eye tracking as an instrument for measuring noticing was assessed and confirmed in a pilot study (n = 9; chapter 4), a different sample of 28 advanced learners of English (L1: Dutch) took part in the main study (chapter 5). These participants read 20 paragraphs in English, 12 of which contained a target area in one of the following four conditions: (I) known, existing word (e.g. *boundaries*), (II) pseudo word (e.g. *paniplines*), (III) pseudo word followed by a semantically constraining existing word (e.g. *paniplines or boundaries*) and (IV) pseudo word preceded by a semantically constraining existing word (e.g. *boundaries or paniplines*).

Analysis of the eye-tracking data revealed evidence for increased attention to the new word forms, even though task instructions had encouraged participants to focus on text meaning. Specifically, we found that:

1. learners spent extra time processing the unknown pseudo words (experimental conditions II, III and IV) in comparison to the matched controls (control condition I);
2. learners invested even more time trying to process the unknown word when immediately afterwards it was followed by a known synonym (condition III). This effect was reflected in longer processing times for the *known* word rather than in further increases in processing time for the *novel* word.
3. the longer learners fixated on the unknown word (all experimental conditions), the more likely they were to recognise that word on an unannounced, immediate vocabulary post-test;
4. the extra processing time observed for the clarifying known word in condition III did not yield better recognition of the preceding unknown word on the vocabulary post-test.

In the concluding discussion of the dissertation (chapter 6), we point towards an integration of Robinson's (1995, 2003) model of noticing in SLA with Dehaene and associates' Global Neuronal Workspace model (e.g. Dehaene & Changeux, 2004) and the classic Craik and Lockhart (1972) levels-of-processing framework. A central claim is that the concept of noticing should be viewed, not as an all-or-nothing event, but as a multidimensional process

defined by *a sequence of events* that involve attention and awareness. The quantity (duration) and quality (nature of mental operations) of the noticing process, then, are hypothesised as predictors of memory strength, i.e. as predictors of the amount of long-term learning.