‘As you like it’: Early context use during encoding relates to successful retrieval from episodic memory

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According to the traditional view of psycholinguistics, language processing is primarily integrative in nature (integration view), but recent years have seen a heated debate about whether language users actively predict upcoming words and their features (prediction view), including morpho-syntactic aspects such as gender. Here, we used the gender marking of German nouns to investigate how individual differences in the use of predictive processing during language encoding relate to subsequent recall of words from memory.

We used a self-paced reading task and a surprise (i.e., previously unannounced) word recognition test. During self-paced reading, participants read sentences such as Nachdem Paul seinen Führerschein erhalten hatte, fuhr er ständig mit DEM AUTO / DER GRUPPE von Freunden, where the gender of the definite article preceding the noun (dem, der) could be used as an early contextual cue to indicate whether the most highly expected noun (Auto) would appear later on or not. To account for spill-over from the definite article, we inserted modifiers and adverbs (e.g., .... mit dem / der alten, aber zuverlässigen Auto / Gruppe), which were not gender-marked. In the subsequent word recognition task, participants were presented with target nouns from the reading task and new nouns, and had to indicate whether they remembered reading these words in the prior part of the study.

Two key findings emerged. First, during encoding, participants showed elevated reading times on the spill-over region after the unexpected article. Thus, readers seemed to actively anticipate upcoming nouns (including their gender), and then showed early effects of having their predictions disconfirmed after reading the unexpected article. Second however, this pattern of early prediction, though significant for the whole sample, was only present in high recallers, in other words, in participants who showed higher recall performance in the word recognition task. Of note, these same people also showed earlier effects of integration during reading, in the form of prolonged reading times at the level of the unexpected noun. Low recallers, in contrast, showed no signs of early prediction or of early integration, but instead experienced very late-stage integration difficulties, in the form of a small and delayed spill-over effect on the first two words after the noun.

In sum, our findings indicate that early use of context during encoding relates to enhanced subsequent memory retrieval: Whereas high recallers showed earlier and stronger signs of having their expectations disconfirmed (in the form of an early prediction effect on the article and an early integration effect on the noun), low recallers only showed evidence of very late-stage integration difficulty (only after encountering the noun). These results corroborate recent research suggesting that not all language users readily use prediction during language comprehension, and that prediction might be contingent on faster and more efficient use of context in some individuals.