

# Statistical learning in printed words

## The role and development of sensitivity to orthographic regularities

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### 1 What types of orthographic regularities are we sensitive to?

Previous research tells us that even though orthographic regularities may not be explicitly taught, repeated exposure to written words makes us sensitive to orthographic regularities via statistical learning. When presented with pseudowords such as **INNARO** and **IHHARO**, readers prefer **INNARO** because they are sensitive to the fact that **NN** is a more frequent consistent pairing than **HH**.

**DARILE**

High bigram frequency

**DAFILE**

Low bigram frequency

When presented with the two pseudowords above, participants on average selected the high bigram frequency item in **63%** of the cases. **This demonstrates that readers are sensitive to regularities more subtle than previously known.**

### 2 How rapidly are orthographic regularities learned?

Previously conducted experiments in visual statistical learning have shown that a few minutes is enough to pick up orthographic regularities in a stream of visual stimuli, but both the number and the visual complexity of the stimuli is simplified.



When asked to perform a word likeness task based on an artificial word flow they had been exposed to for approximately five hours, participants preferred items with high frequency bigrams **72%** of the time. **This confirms that a very small amount of time is necessary for readers to capture facts about letter occurrences.**

### 3 What is the impact of sensitivity to orthographic regularities?

Once learned, do orthographic regularities play a role in visual word recognition, specifically letter identification? It is assumed that high-frequency letters are more rapidly recognized than low-frequency letters but no reliable evidence has been reported.



After the word likeness task, the same participants were asked to perform a letter detection task. Half of the targets contained the frequent bigram, the other half was made of random characters. The letter to be detected was either a letter of the frequent bigram, or not. It was found that high frequency letters were detected more rapidly. **The evidence is clear: new information about letter distribution, learned previously, is rapidly integrated in the visual word recognition system.**

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