Reading is Unnatural

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CONGRATULATIONS!! YOU ARE ILLITERATE :)

Reading is Unnatural

Humans are "prewired" to learn a spoken language, but not to learn to read.

Reading is an artificial skill we learn by practice and instruction. Takes time.

Learning to read = Training our visual system

- Training our visual system to detect patterns, such as those textual patterns, is a necessary part of learning to read.

- Text Patterns:
  - Lines, contours, and shapes – basic visual featured recognized by our brain naturally.
  - These basic features merge form patterns – letters, numeric digits, concepts
  - Morphemes: "Present" and "ing" or "look" and "ed"
  - Phrases, idiomatic expressions and sentences
  - Sentences combine to form sentences.
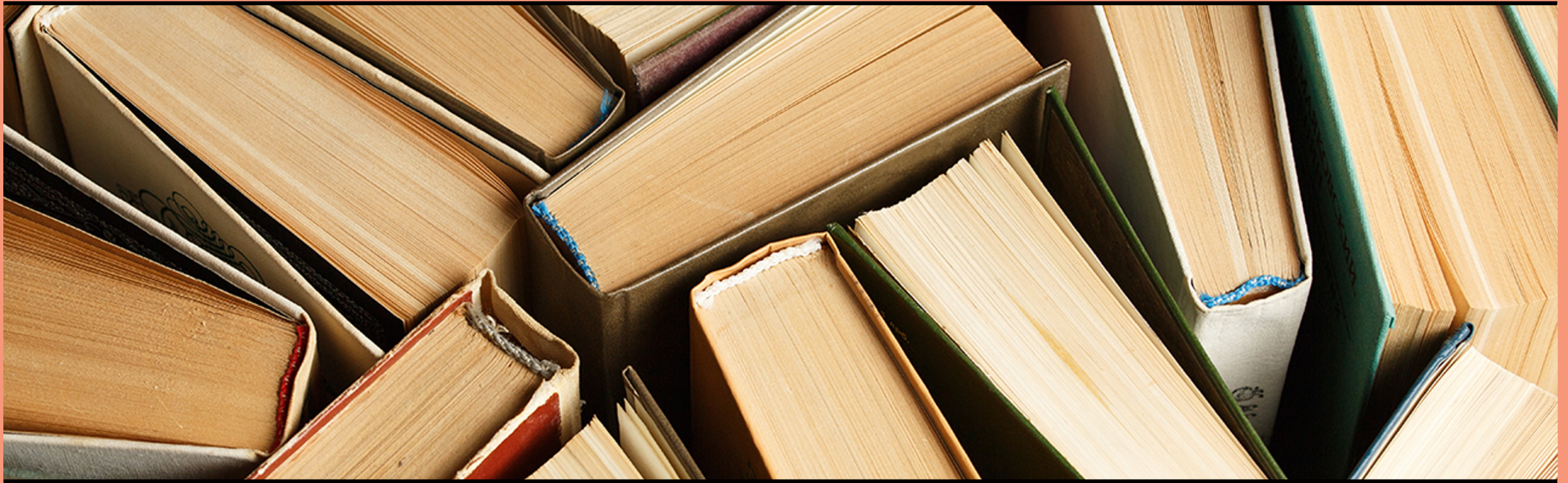
How we read

- Reading becomes semi-automatic or fully automatic once our visual system and brains have successfully been trained -the eye movement and processing of the information.

- Fovea and Perifovea is the only part of our visual field is trained to read.

How we read

- Saccades – movement of our eyes jumping around several times a second. It lasts about 0.1 sec.

- You don't scan texts smoothly across the line but, eyes continue with saccades and jump through important words while capturing basic patterns and transmitting the information to the brain for further analysis.

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- **Bold** letters represent fixations — what the eye is seeing directly in its foveal view.
- <u>Underlined</u> letters represent what is <u>subconsciously processed during a fixation</u>, not what we see directly. This is referred to as our *parafoveal* view and gives us partial information of what is to come next.

- The complete sentence: *Eye movement experimentation in a laboratory setting aids in our understanding of the reading process*.

Feature Driven or Context Driven?

- Feature Driven – bottom up
  - Context free
  - Identifies simple features – curves, lines, edges
  - Recognizes morphemes, words and phrases

- Context Driven – top down
  - Parallel to feature driven reading
  - Visual system starts by recognizing high – level patterns like words and phrases and sentences
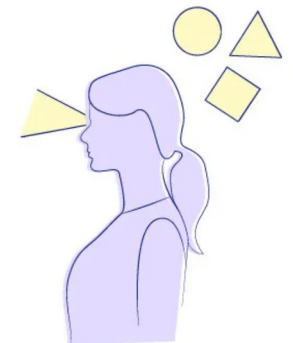 - Determine what components of high level pattern must be after

Top-up processing: using models, ideas, and expectations to interpret sensory information

What am I seeing?

Is that something I've seen before?

Bottom-up processing: taking sensory information and then assembling and integrating it

Never gonna give you up Never gonna let you down

THE CAT

Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae. The rset can be a toatl mses and you can sitll raed it wouthit porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

Top dwon raednig

Novice Readers:

- First, Wernicke part of the brain activates and matches the word with their corresponding sounds.

- Broca's region detects morphemes and words as units of meaning, then interact with the word-analysis area to extract the overall meaning.

- In ideographic languages, symbols stand in for full words and frequently match to their meaning graphically.

Skilled and unskilled reading uses different parts of the brain

Broca
Morphemes and words are recognized

Wernicke
Letters are matched and their corresponding sounds
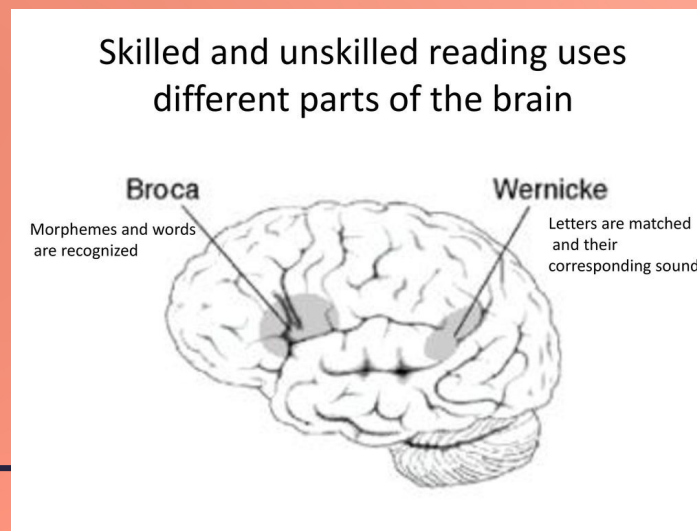
Advanced Readers

- Word – analysis is skipped entirely.

- occipitotemporal area (behind the ear, not far from the visual cortex) becomes active

- Recognizes words without sounding it out

- Broca's area only slightly used.

Poor Information Design can Disrupt Reading

- Uncommon and Unfamiliar Vocabulary

Stick with being the "unsophisticated" pooh when it comes to word choices

Difficult scripts and typeface

- *We are trained to recognize combination of shapes as characters.*
- *Typeface with difficult-to-recognize features and shapes will be hard to read.*

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Tiny Fonts

- Using fonts that are too small can be laborious for the users to read.
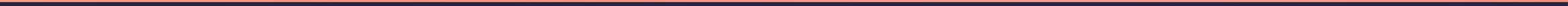
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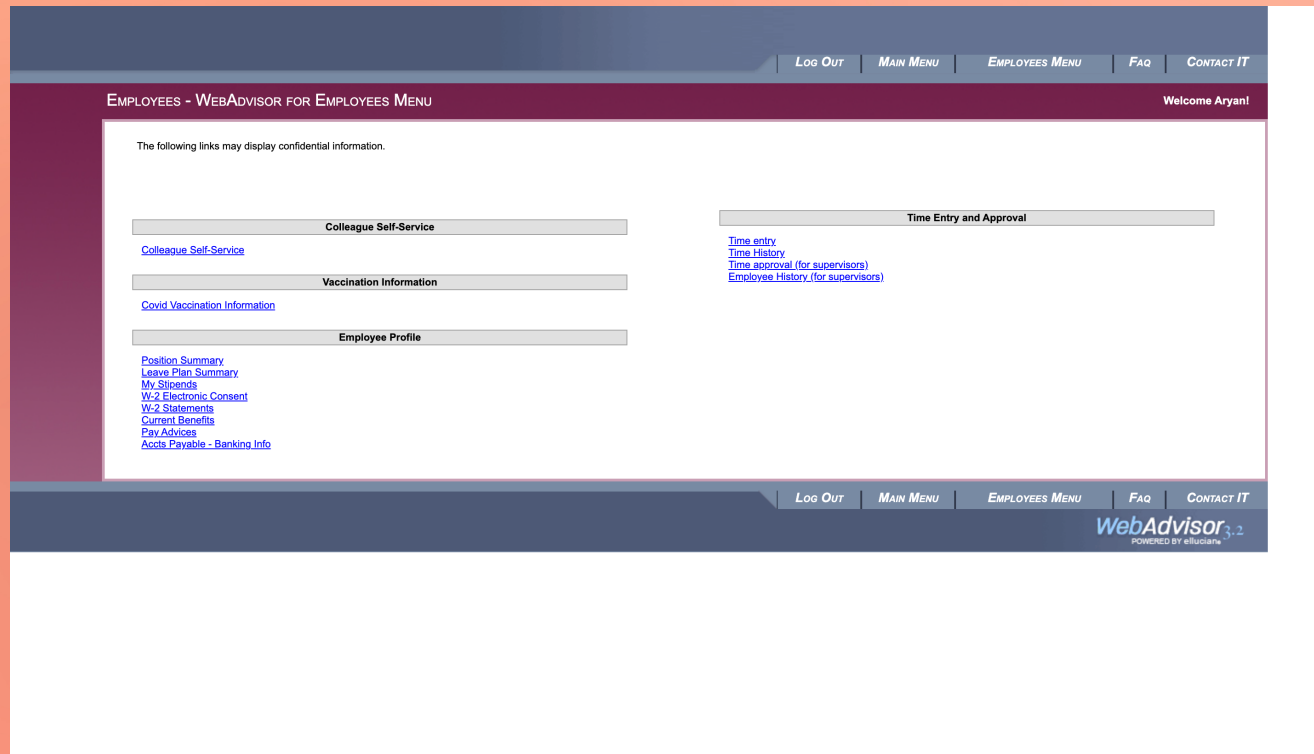
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Text on noisy background

- Reading can shift from an automatic feature-based mode into a more conscious and context-based mode as a result of visual noise in and around text that interferes with the detection of features, letters, and words.
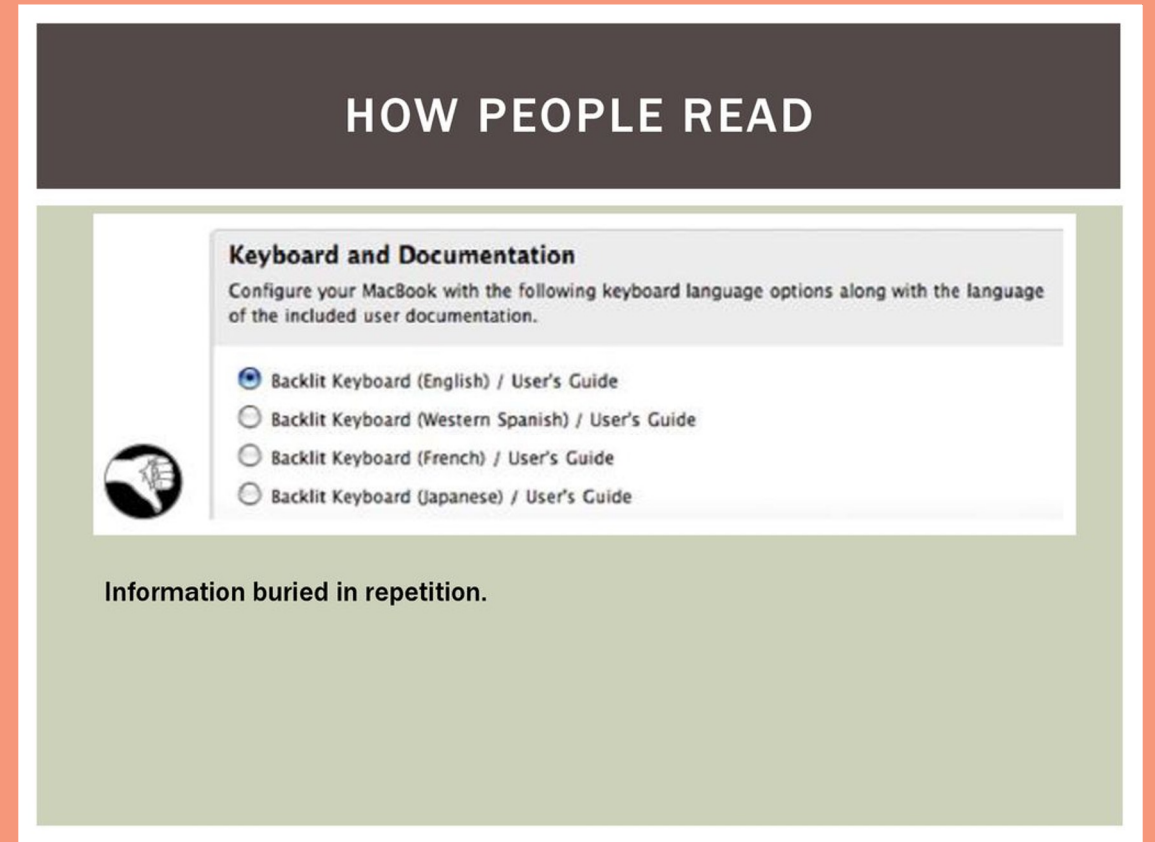
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Information buried in repetition

- The text itself can also produce visual noise.

- Repetition in subsequent lines of text makes it difficult to distinguish the vital information from less significant information and gives readers inadequate feedback about which line they are focusing on.

HOW PEOPLE READ

Keyboard and Documentation
Configure your MacBook with the following keyboard language options along with the language of the included user documentation.

- ◉ Backlit Keyboard (English) / User's Guide
- ○ Backlit Keyboard (Western Spanish) / User's Guide
- ○ Backlit Keyboard (French) / User's Guide
- ○ Backlit Keyboard (Japanese) / User's Guide

Information buried in repetition.

Centered Text

- Skilled readers are automatic readers.

- In automatic reading we tend to have eye movement from left to right.

- Each line of text begins in a distinct horizontal position whether it is either centered or aligned to the right. Therefore, because of the incorrect location of automatic eye movements, we must actively direct our focus to the beginning of each line.

- This causes us to exit automatic mode and significantly slows us down.

- Valid for poems and wedding invitations.

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Support users to read
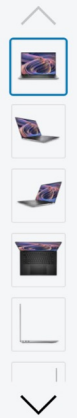
- Avoid disruptive flaws discussed earlier

- Use restricted highly consistent language which is also known as plain language.

- Format text to assist easy scanning. (using bullets, table etc)

Much of the Reading Required by Software is Unnecessary

- Some user interfaces may use too much text requiring users to read more than necessary.

- Minimize the need for reading

Test on real users.