

Psychology of Language

20 Reading

Fall 2023

Tues/Thur 5:00-6:15pm

Emma Wing
Drop-in hours:
Wednesdays 3-4pm
& by appointment
[Webex link](#)

Road map

- Unit 3: Language, Brain, & Diversity
 - 19 Acquired aphasia (Review)
 - 20 Reading

Learning objectives

- Name 3 kinds of writing scripts
- Describe the dual-route model of reading
- Name two types of dyslexia and how the dual-route model of reading can explain their reading profiles
- Define *saccade*, *fixation*, and *perceptual span*
- Name 3+ things that can affect eye movements during reading

Writing systems

- Logograms

我們研究如何將人類心靈的語言處理

Chinese

私たちは、人間の心は、言語を処理する方法を学ぶ

Japanese kanji

Writing systems

- Syllable scripts

Hiragana (ひらがな)											
n	wa	ra	ya	ma	ha	na	ta	sa	ka	a	
ん <small>n</small>	わ <small>wa</small>	ら <small>ra</small>	や <small>ya</small>	ま <small>ma</small>	は <small>ha</small>	な <small>na</small>	た <small>ta</small>	さ <small>sa</small>	か <small>ka</small>	あ <small>a</small>	a
		り <small>ri</small>		み <small>mi</small>	ひ <small>hi</small>	に <small>ni</small>	ち <small>chi</small>	し <small>shi</small>	き <small>ki</small>	い <small>i</small>	i
		る <small>ru</small>	ゆ <small>yu</small>	む <small>mu</small>	ふ <small>fu</small>	ぬ <small>nu</small>	つ <small>tsu</small>	す <small>su</small>	く <small>ku</small>	う <small>u</small>	u
		れ <small>re</small>		め <small>me</small>	へ <small>he</small>	ね <small>ne</small>	て <small>te</small>	せ <small>se</small>	け <small>ke</small>	え <small>e</small>	e
	を <small>wo</small>	ろ <small>ro</small>	よ <small>yo</small>	も <small>mo</small>	ほ <small>ho</small>	の <small>no</small>	と <small>to</small>	そ <small>so</small>	こ <small>ko</small>	お <small>o</small>	o

Japanese

Writing systems

- Alphabetic scripts

abcdefghijklm
nopqrstuvwxyz

English

و
ل
غ
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خ
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د
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Arabic

א ב ג ד ה ו ז ח
ט י כ ל מ נ
ס ע פ צ ק ר ש ת
ת

Hebrew

А Б В Г Д Е
Ё Ж З И Й К
Л М Н О П Р
С Т У Ф Х Ц
Ч Ш Щ Ъ Ы
Ь Э Ю Я

Cyrillic

Writing systems

- Alphabetic scripts

abcdefghijklm
nopqrstuvwxyz

English

و
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Ё Ж З И Й К
Л М Н О П Р
С Т У Ф Х Ц
Ч Ш Щ Ъ Ы
Ь Э Ю Я

Cyrillic

Writing systems

- What processes must be involved in reading? Can you draw a simple model?
- Consider previous classes and the different kinds of scripts

How do we pronounce this word in English?

Ghoti

How do we pronounce this word in English?

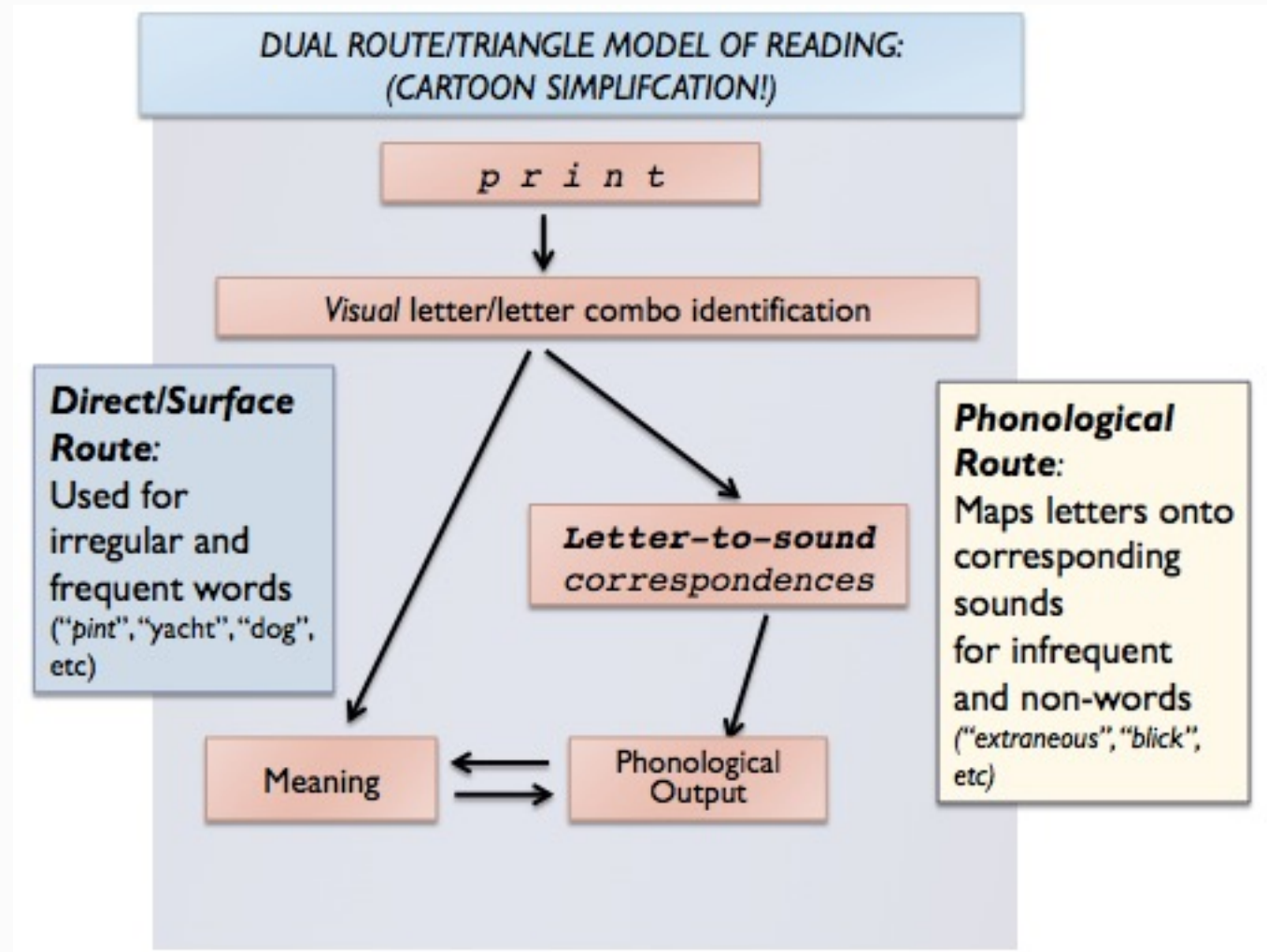
Ghoti

“gh” from “enough”

”o” from “women”

“ti” from “nation”

Dual-route model of reading

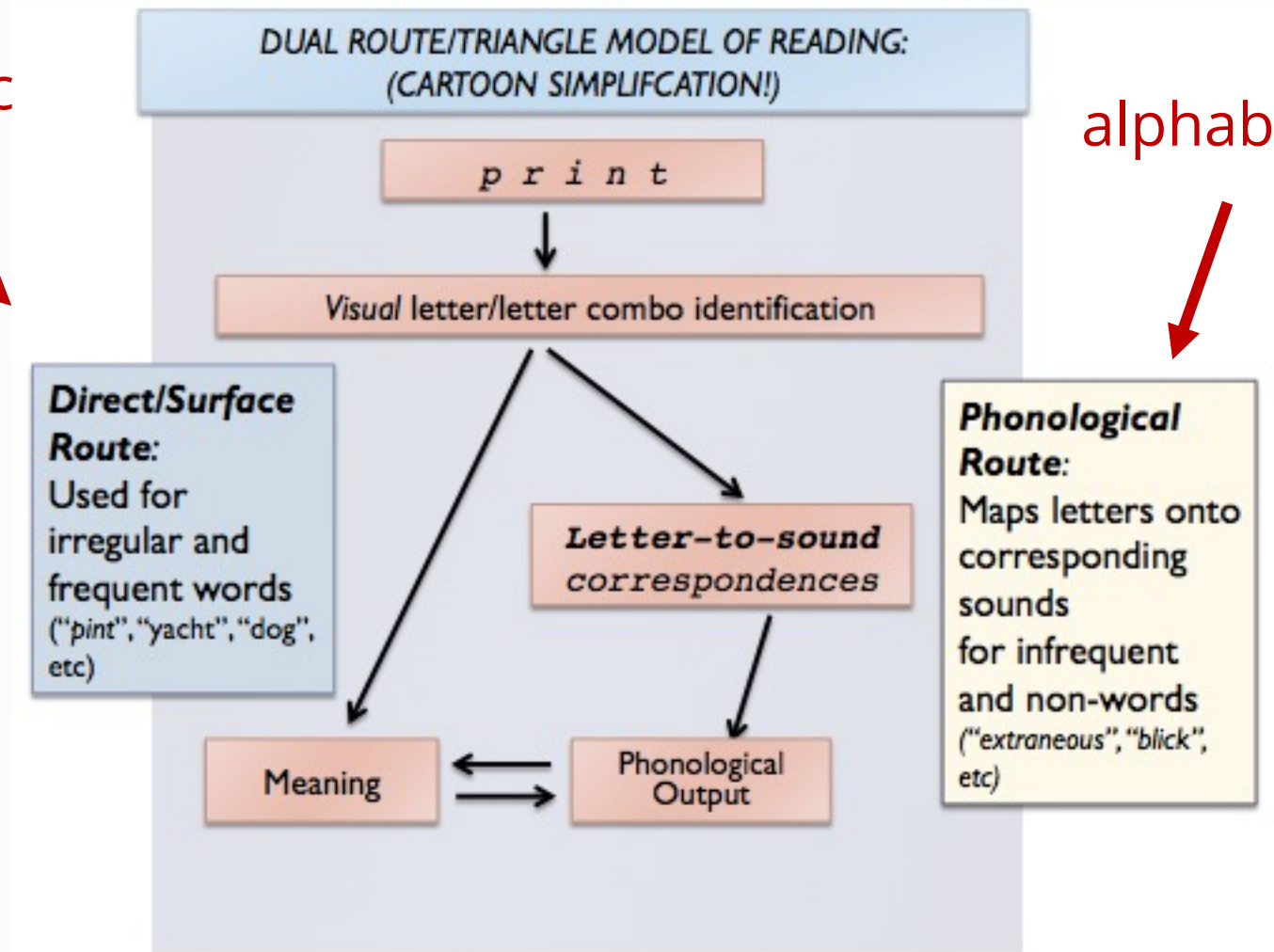


Dual-route model of reading

logographic



alphabetic

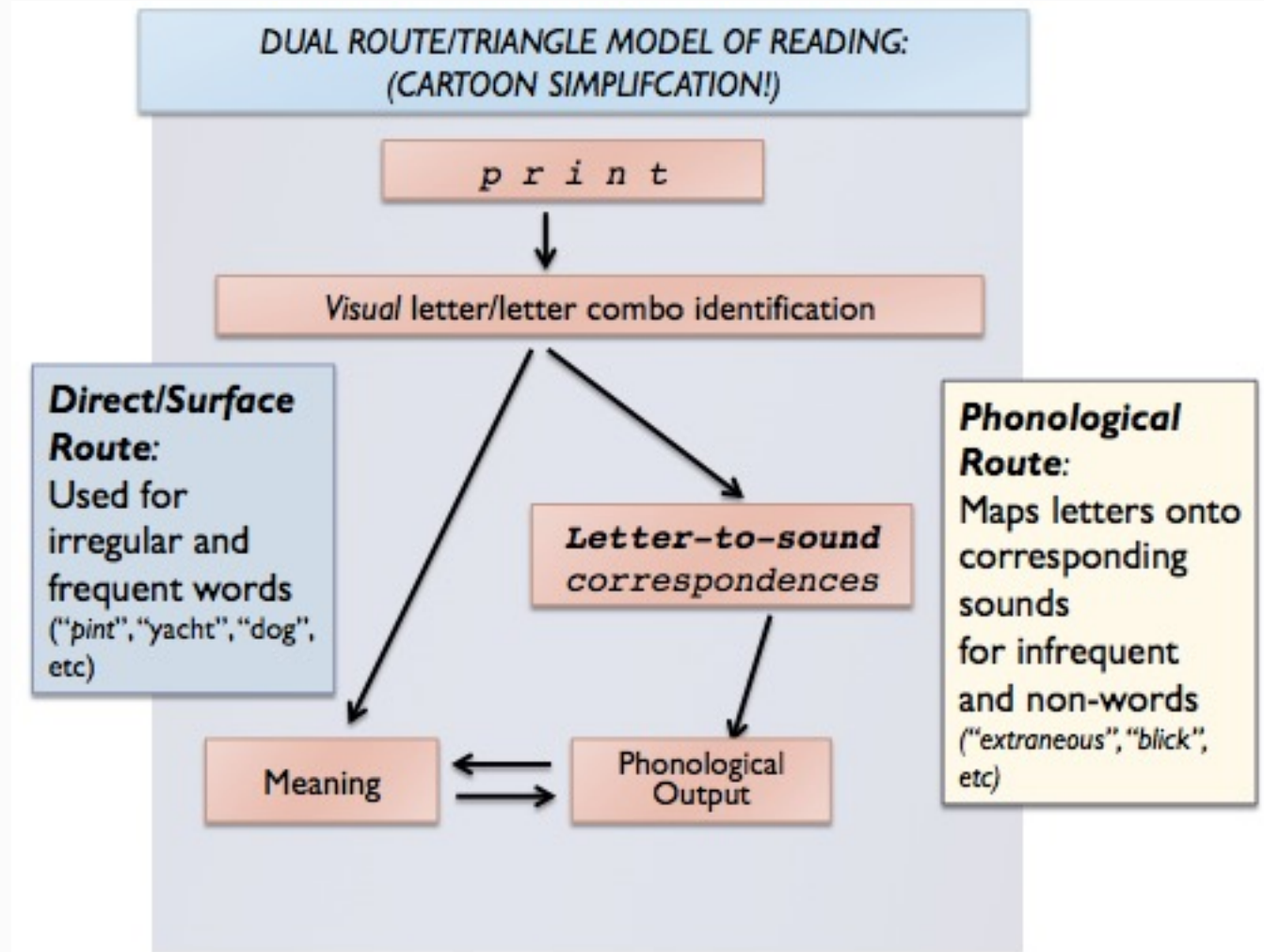


Developmental dyslexia: reading profiles

Model can be used to explain the “reading profiles” of people with developmental dyslexia.

We can assign them to one subtype or another.

We’ll come back to this next class!



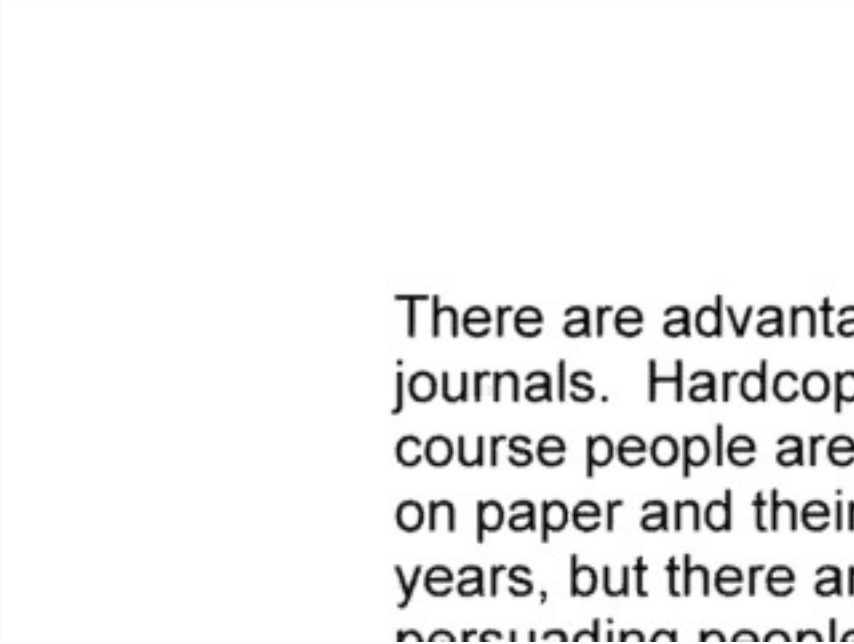
Eye movements during reading

Eye movements during reading

There are advantages and disadvantages of both electronic and hardcopy journals. Hardcopy journals are more easily browsed, more portable and, of course people are very much used to their format. Electronic journals save on paper and their format has improved considerably over the past few years, but there are still problems over managing copyright restrictions and persuading people to use electronic instead of hardcopy journals. There is also the problem of portability. More and more journals are now being published in electronic format, although some publishers will only let you subscribe to an electronic journal provided you also subscribe to the hardcopy (more money for the same thing). Some electronic journals cost over 100% more than their equivalent hardcopy. With all these factors in mind I have been discussing individual and shared-subscriptions with the Biochemistry Department, the RSL and Blackwell's. Whilst I feel that a move from hardcopy to electronic journals will be a very slow process in the ULP Library, electronic publishing is being carefully monitored and I would hope to introduce a few electronic texts into the Library alongside the journals which are already available for free over the Internet.

Eye movements during reading

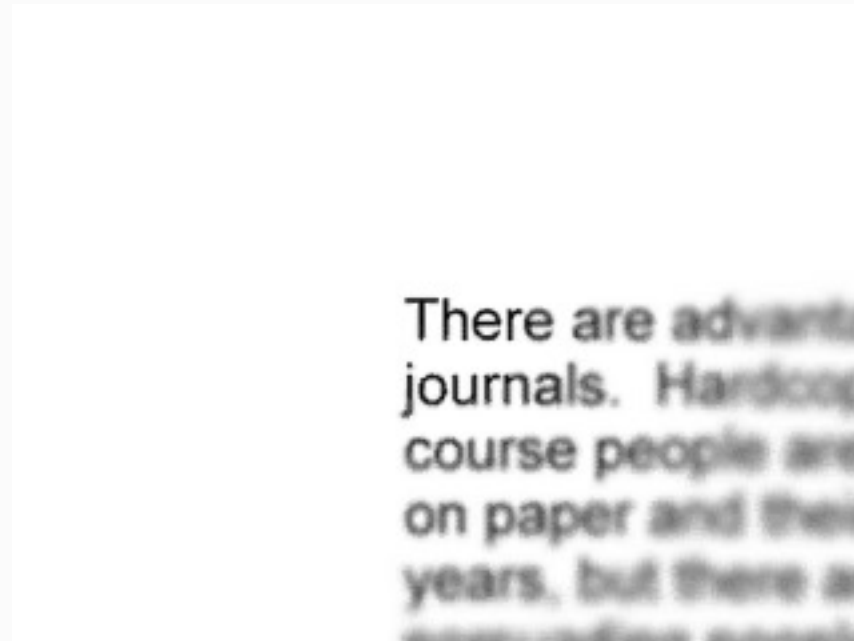
- Eye-centric view of the text



There are advantages of hardcopy journals. Hardcopy journals are, of course, people are used to reading on paper and their eyes are used to reading on paper, but there are advantages of hardcopy journals over electronic journals.

Eye movements during reading

- What the eye sees



Eye movements during reading

- **Fixations:** when the eye is still
 - 200-250 milliseconds
- determined by...
 - length
 - frequency
 - syntactic category
 - predictability
 - cognitive load

Eye movements during reading

- **Saccades:** when the eye moves
 - 25-30 milliseconds
 - length is language (orthography)-specific
 - English: 8 characters
 - Hebrew: 5.5 characters
 - Japanese: 3.5 characters
 - Chinese: 2 characters
- The amount of information matters

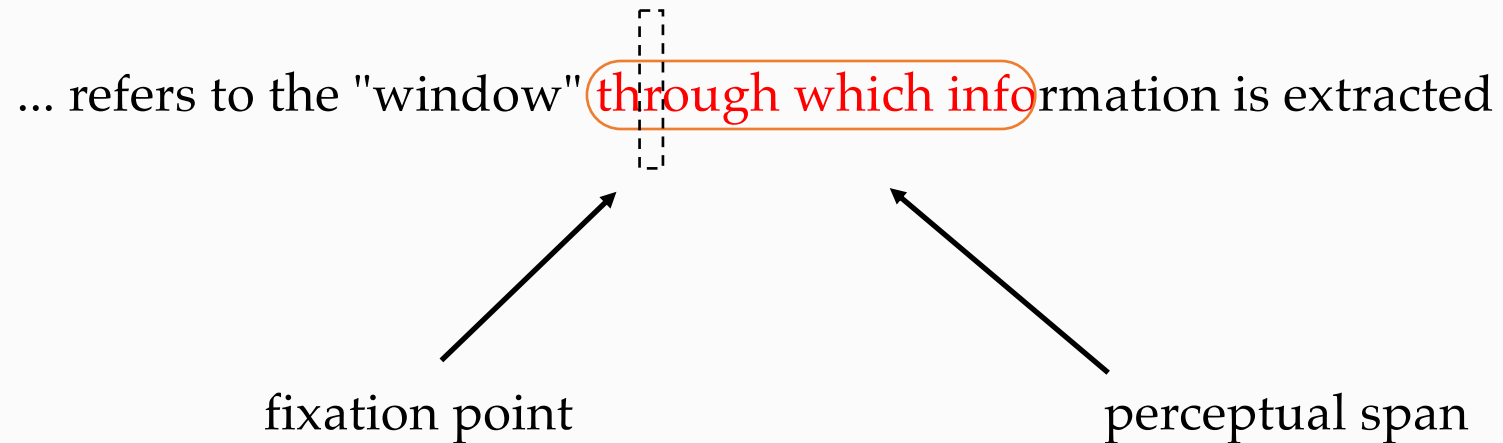
Eye movements during reading

- How much information is extracted on each fixation?

Eye movements during reading

- How much information is extracted on each fixation?

In **English** ~15 characters to the right of fixation



- Perceptual span is the length of a saccade x2

Eye movements during reading

- How much information is extracted on each fixation? **Demo**



Eye movements during reading

- How much information is extracted on each fixation? **Demo**



Eye movements during reading

- How much information is extracted on each fixation? **Demo**

Xxx xxx●xxxxxx xxxxx xxx xxxxxxxx xx x..

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

Xxx xxx●xxxxxx xxxx xxx xxxxxxxx xx x..

Eye movements during reading

- How much information is extracted on each fixation? **Demo**



Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The pol●tician read the speech to a..

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The pol●tician read the speech to a..

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The politician read the speech to a..

within ~7 characters, participants notice the change

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The politician read the speech to a..

More than ~12 characters, participants don't notice the change

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The politician read the speech to a..

What do you think happens between 7-12 characters?

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The politician read the speech to a..

participants still don't notice, but fixation durations change!

The more similar the original word to the final word, the shorter the fixation durations on the final word.

speech < spaach < blaach

Eye movements during reading

- How much information is extracted on each fixation? **Demo**

The politician read the speech to a..

Participants (YOU!) still don't notice, but fixation durations change!

The more similar the original word to the final word, the shorter the fixation durations on the final word.

speech < spaach < blaach

Eye movements during reading

- Misspelled words

According to research at Cambridge University, it doesn't matter what order the letters in a word are, the only important thing is that the first and last letters are in the right place. The rest can be a total mess and you can still read it without a problem. This is because we do not read every letter by itself but the word as a whole.

Eye movements during reading

- Misspelled words

According to research at Cambridge university, it doesn't matter what order the letters in a word are, the only important thing is that the first and last letters are in the right place. The rest can be a total mess and you can still read it without a problem. This is because we do not read every letter by itself but the word as a whole.

Eye movements during reading

- What drives eye movements?
 - physical properties of the stimulus
 - # of letters in word
 - linguistic properties of the stimulus
 - Frequency, syntactic category, predictability
- Why might they be important to measure?
 - they are useful as an experimental tool
 - they may be useful as a diagnostic tool
 - schizophrenia; Alzheimer-type dementia; Parkinson's

Key concepts

- ✓ Kinds of writing systems
 - ✓ Logographic scripts, syllabic scripts, alphabetic scripts
- ✓ Dual route model of reading
 - ✓ Direct route = print to meaning
 - ✓ Phonological route = print to sound to meaning
- ✓ What the eyes do when we read
 - ✓ Fixations
 - ✓ Saccades
 - ✓ Perceptual span
- ✓ What affects eye movements when we read