



Where do children and adults look when watching videos with same-language subtitles?

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turnonthesubtitles.org

“Extensive research from top academics in many countries has shown that simply turning on the subtitles for children’s television improves literacy. Dramatically. In fact it may double their chance of becoming a proficient reader ...

...we all now call on ... to all turn on the subtitles, by default, for children’s TV programmes. This needs to be done as a matter of urgency. This simple change will make the world of difference to millions of young people....”

However, there is not a robust evidence base for these claims, and we don’t know at what point in reading acquisition subtitles might be most useful.

Use eye-tracking to measure how children engage with subtitled television



Does attention to subtitles and looking behaviour change with school year / reading ability?

Do subtitles impact understanding of the content of the videos?

Experiment 1



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Eye-tracking experiment

Four videos: two with subtitles
and two without subtitles

Comprehension questions after
each video



Behavioural testing

Oral reading fluency assessment
(TOWRE-2)

Vocabulary assessment
(BPVS-III)

Short survey about experience
with subtitles



Four short videos (4:13 – 5:05)
from animated films:

Taking Flight (2016)

The Road to El Dorado (2000)

The Rescuers Down Under (1990)

The Wild (2006)

Unfamiliar and engaging (survey
among seven children).

With diverse language:

of subtitles – 64-116

of words – 283-547

reading ease score – 81.2-89.5

Participants



In total 210 participants: **180 children and 30 adults**

Year 1 – 30 children (16 girls / 14 boys)

Year 2 – 30 children (16 girls / 14 boys)

Year 3 – 30 children (17 girls / 13 boys)

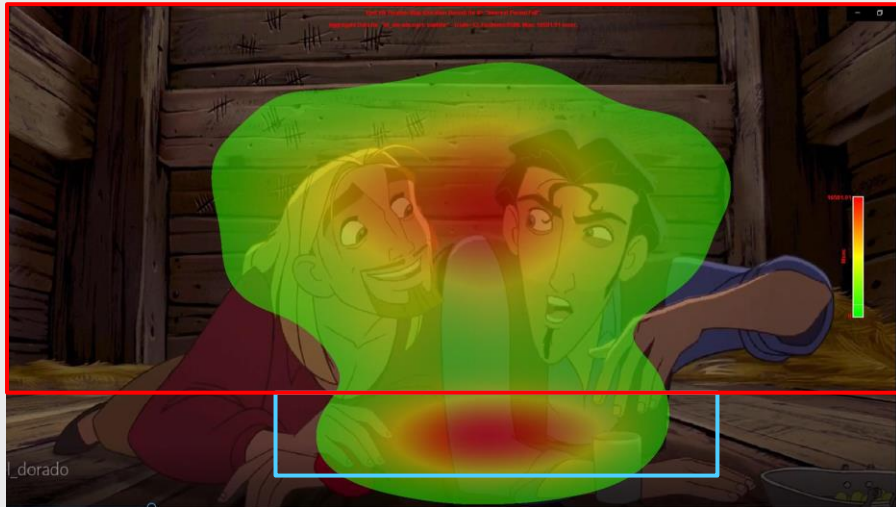
Year 4 – 30 children (16 girls / 14 boys)

Year 5 – 30 children (15 girls / 15 boys)

Year 6 – 30 children (16 girls / 14 boys)

- English as their first language,
- without special language or literacy needs,
- 17% of children were disadvantaged

Analysis: global and word-level



Global eye-movement behaviour

video interest area
subtitles interest area

The % of fixations on the subtitles and on the video in videos with and without subtitles.

Word-level eye-movement behaviour

interest areas for each word in a subtitle

Readers are sensitive to word properties like length and frequency. Effects of word length and frequency indicate word processing.

Videos without subtitles



In videos without subtitles, all participants looked at the video area in the center of the screen.

91-94% of fixations in the video area

3% of fixations in the “subtitle” area (without subtitles)

Some fixations at the eye tracker or other parts of the screen.

Do children pay attention to subtitles?



Y 1



Y 6

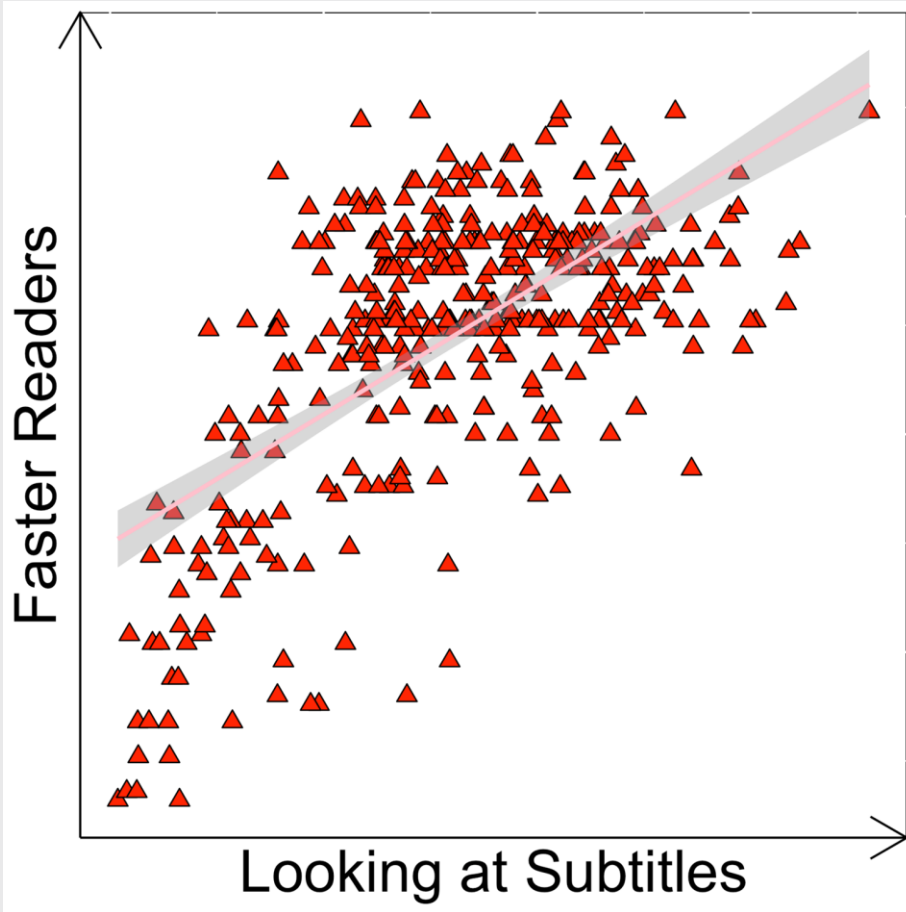


- Year 1 – 17% of fixations (range 2-42)
- Year 2 – 29% of fixations (range 8-53)
- Year 3 – 35% of fixations (range 13-52)
- Year 4 – 36% of fixations (range 12-52)
- Year 5 – 37% of fixations (range 9-57)
- Year 6 – 35% of fixations (range 16-48)

Children pay progressively more attention to subtitles.

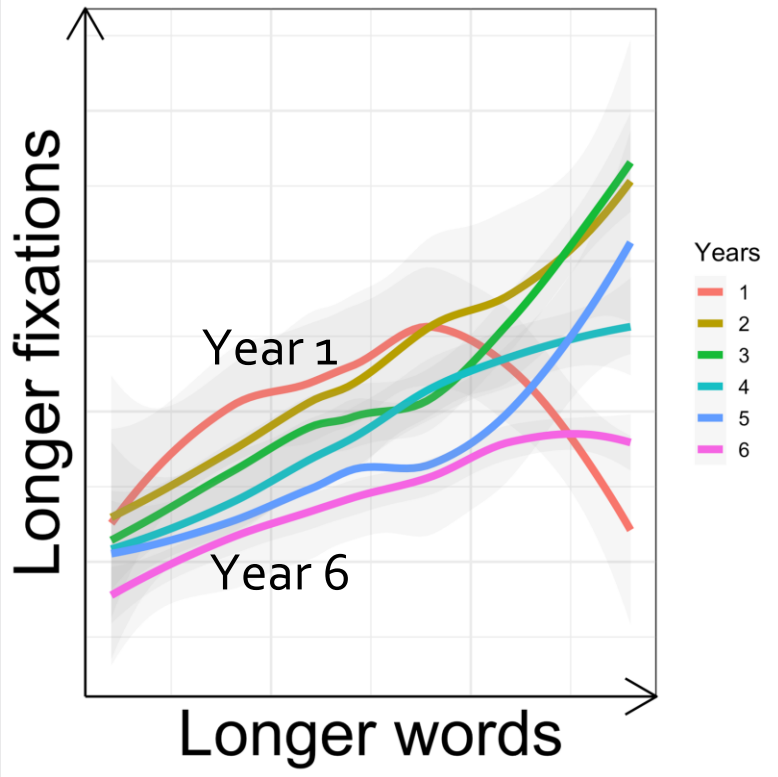
Adults – 31% of fixations

Is attention to subtitles related to reading skills?



Attention to subtitles is associated with reading skills (word-reading speed assessed by TOWRE).

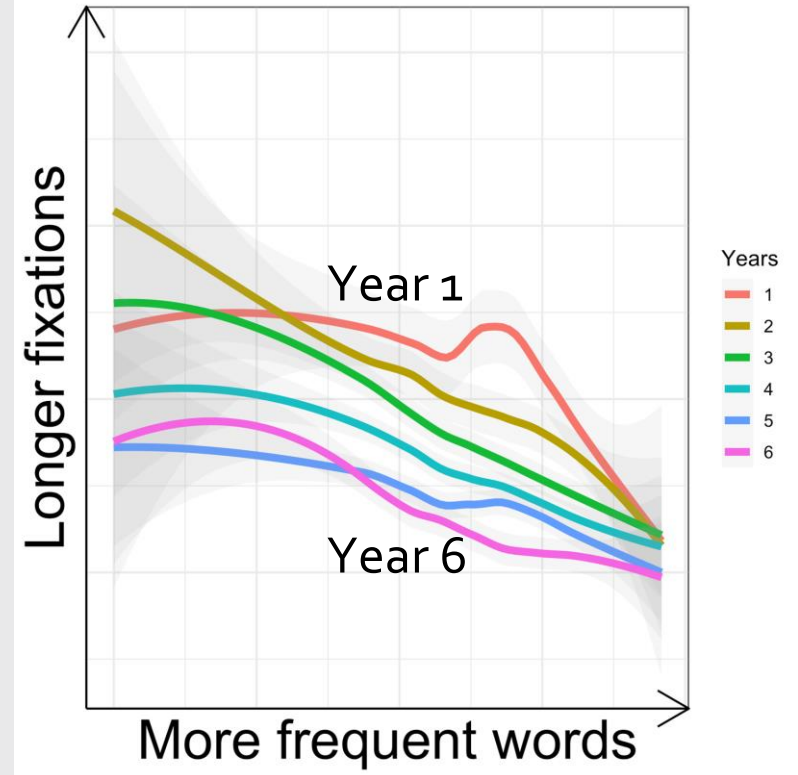
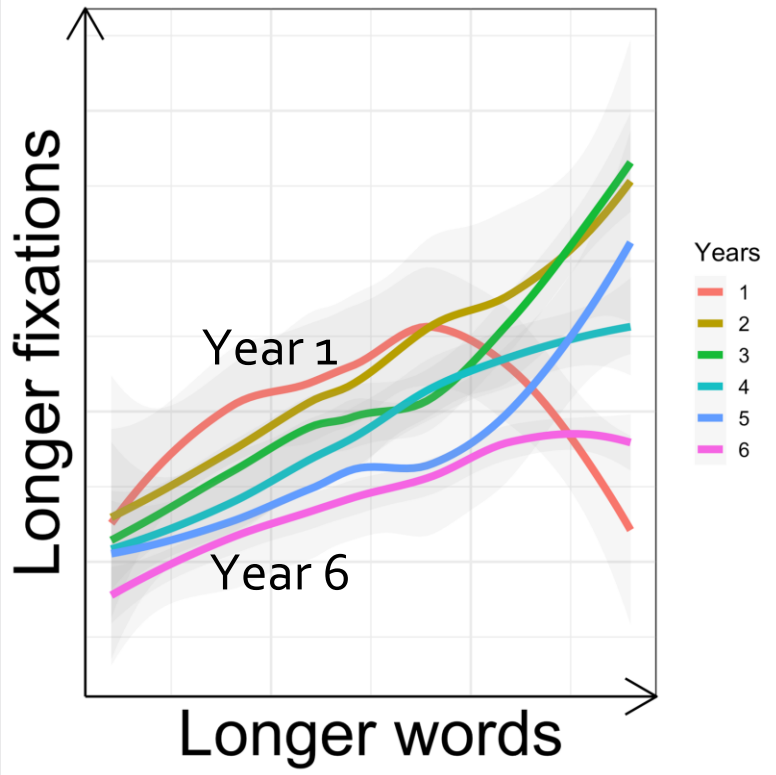
Do children read subtitles?



Longer words require longer fixations.
The effect of length becomes smaller
with school year.

→ signs of reading

Do children read subtitles?

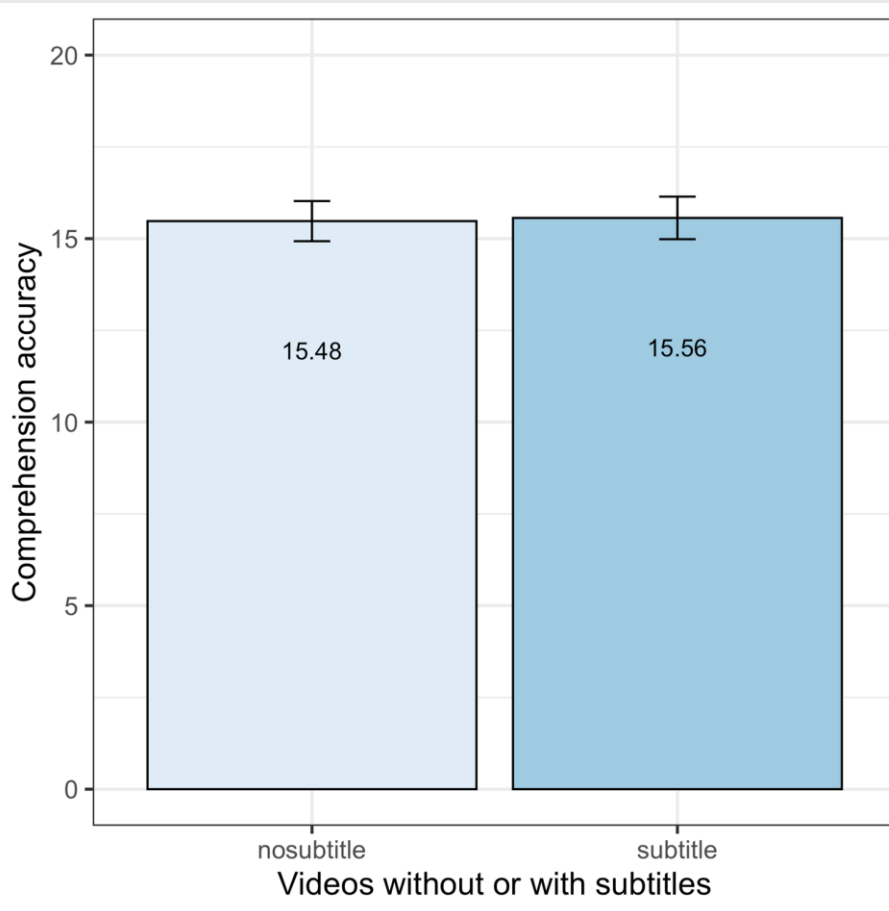


Longer words require longer fixations. The effect of length becomes smaller with school year.

More frequent words required shorter fixations. The effect of frequency becomes smaller with school year.

→ signs of reading

Do subtitles impact children's understanding?



Comprehension improves with school Year (50% → 85%).

Comprehension accuracy is comparable for videos with and without subtitles.

No evidence that subtitles improve or impair comprehension.

Children's attitude towards subtitles



Years 1-2

Don't know what subtitles are. Had no previous experience with them.

Year 3

Many children know what subtitles are, a few of them had experience with subtitles.

Years 4-6

All know what subtitles are. A half had experience with them.

To understand accents /
When the sound is too quiet /
Deaf relative /
To understand the content better

What do these results tell us?



Children don't look at subtitles until they reach some level of reading proficiency. → **Children are unlikely to learn to read from subtitles.**

Children with better reading proficiency (many children in Years 2-3 and later) read subtitles and pay a lot of attention to them. → **Subtitles may help children who read fluently get additional reading practice.**

Overall, subtitles seem not to improve or impair comprehension.

What's next?



Experiment 2 (intervention study):

Does 6 weeks of experience with subtitles influence children's attention to them?

Will this experience influence children's scores in standard tests of reading ability?

We are looking for local schools to help us recruit families to participate in this study.

<https://www.rastlelab.com/subtitles>



Children, teachers, schools



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