



The Effects of Full and Abridged Subtitles on Multimedia Learning in a Foreign Language

Haichen Yang and Emma H. Geller
University of California, San Diego

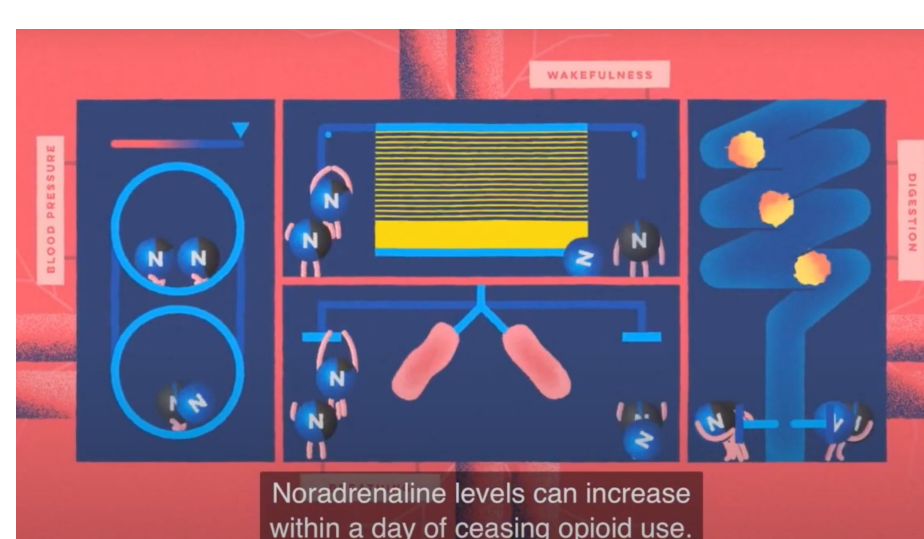


Introduction

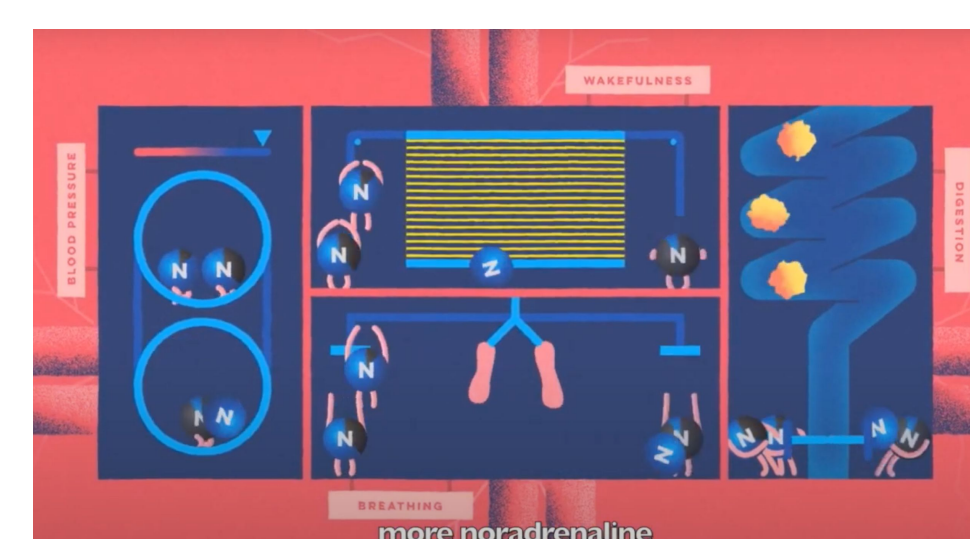
The verbal redundancy effect refers to the impairment of learning that occurs from the simultaneous presentation of narration and on-screen text with identical words (Moreno and Mayer, 2002). However, other researchers have explored the conditions under which subtitles would facilitate learning - e.g. abridged on-screen text, which only contain key information from narration, directs learners' attention to the main ideas (Yue, Bjork, E. L., & Bjork, R. A., 2013), subtitles may be helpful for EFL learners as they compensate for the transiency of narration (Lee & Mayer, 2018). For this study, we aim to investigate the verbal redundancy effect in EFL students by showing native speakers of Mandarin a lesson narrated in English with either no subtitles, English subtitles, or Mandarin subtitles. Additionally, those subtitles will either be fully redundant with the narration, or abridged to highlight key terms and phrases.

Design & Materials

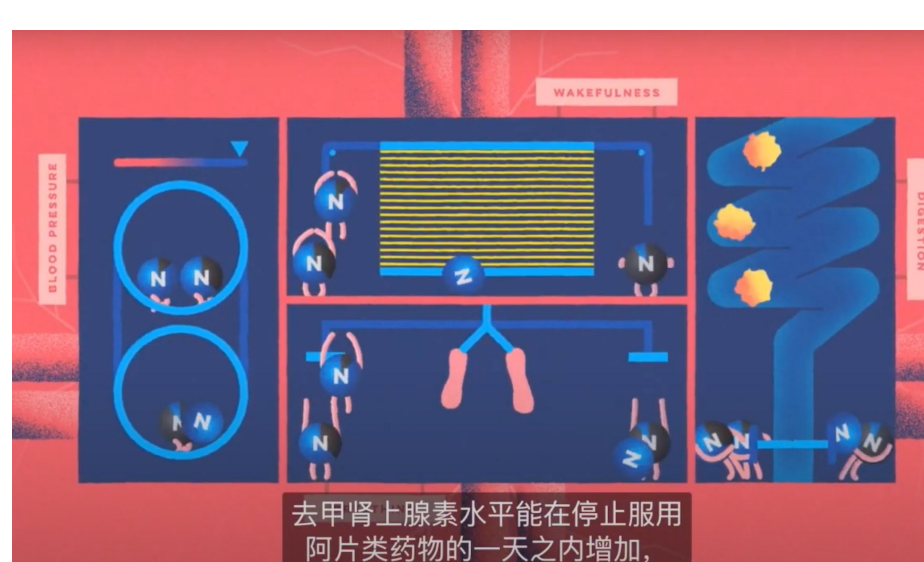
- 2 x 2 between-subjects factorial experiment.
- **IVs:** Length of subtitles (full vs. abridged), Language of subtitles (English vs. Mandarin).
- **DV:** Posttest score, 17 questions in total.
Retention - 3 open-responses & 12 multiple-choice
Transfer - 2 open-response
- **Subtitles** were created using iMovie
-> Full subtitles were obtained from the TED website.
-> Abridged subtitles were created by identifying key phrases in the transcript.



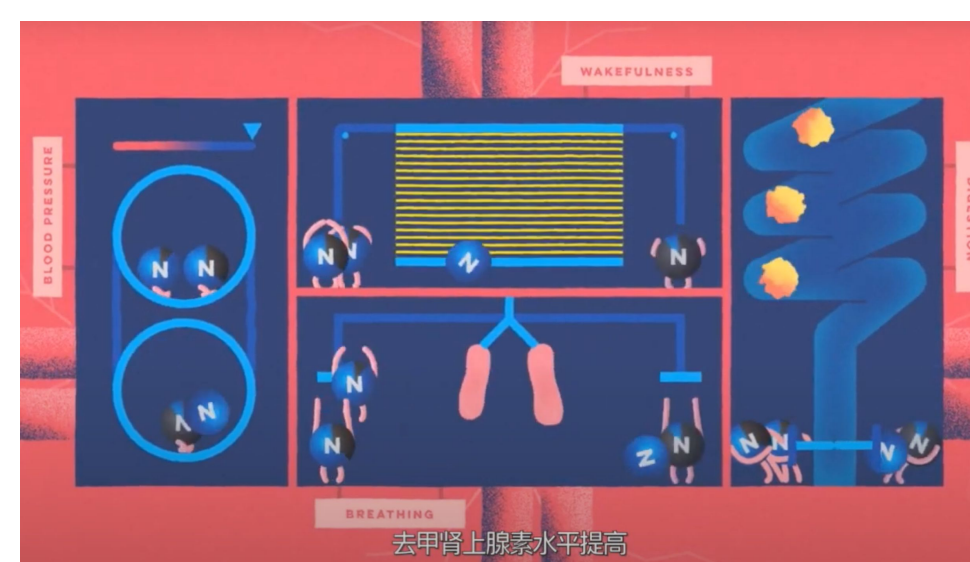
Full English subtitles



Abridged English subtitles



Full Mandarin subtitles



Abridged Mandarin subtitles

Control condition - No subtitles displayed

Experiment 1

Participants - 260 undergraduate students from UCSD, all native Mandarin speakers.

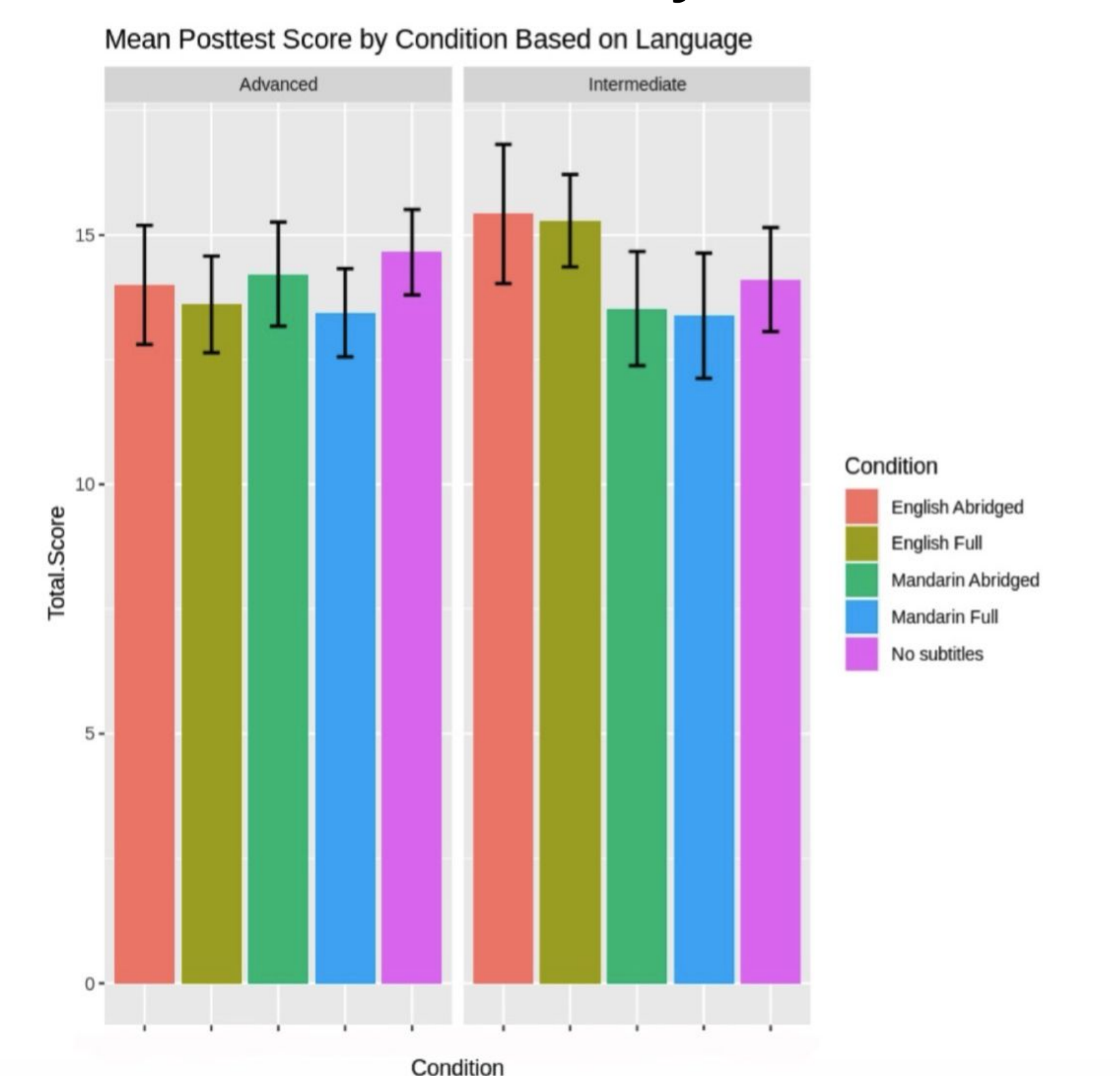
Materials - Ted-Ed video on opioids (8:19)

Hypotheses:

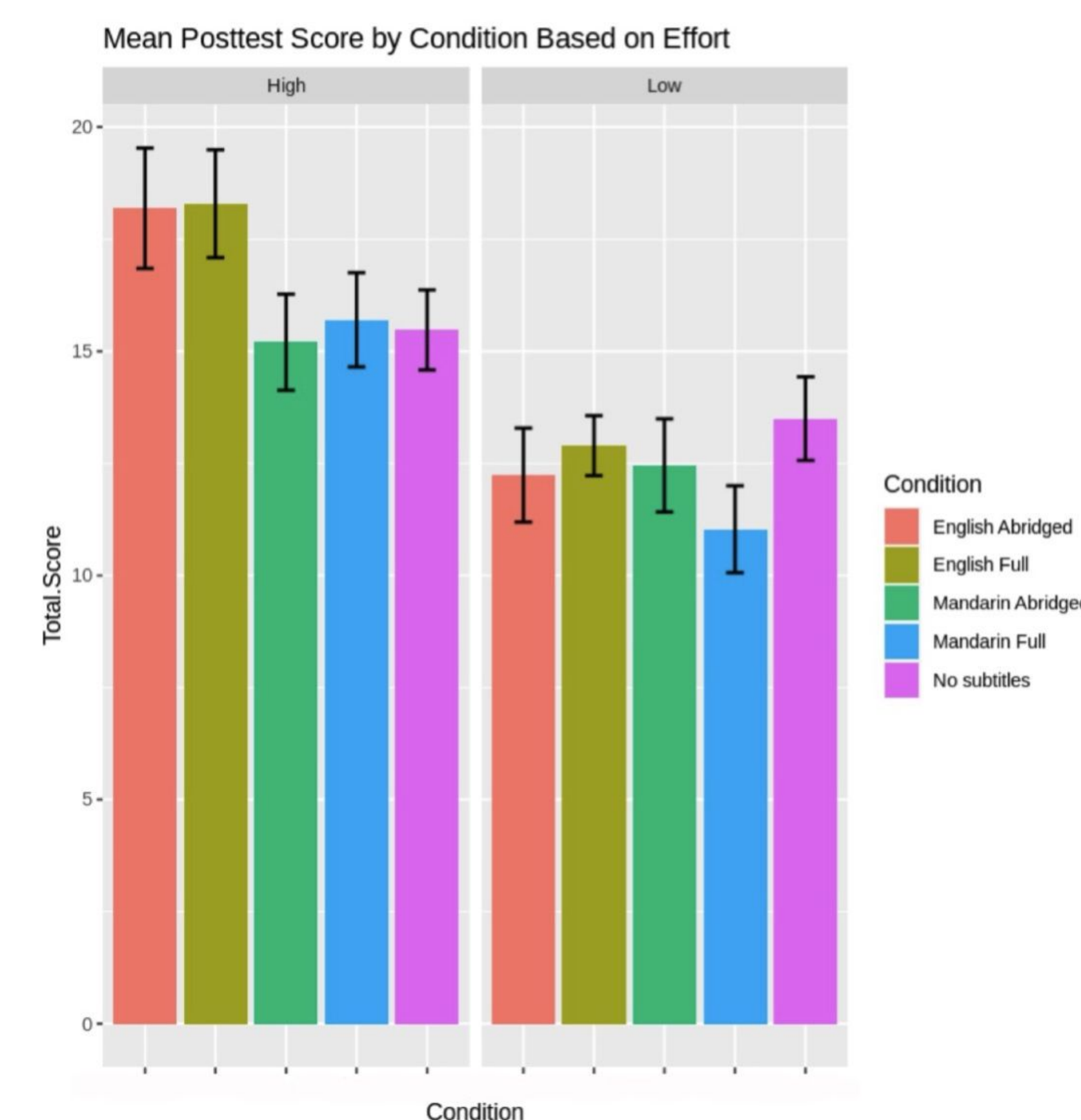
1. Abridged subtitles > Full subtitles > Control
2. For high English proficiency, English = Mandarin
3. For low English proficiency, English ≠ Mandarin

Results:

No main effect of Subtitles condition and no interaction with Proficiency



Significant effect of language (p=0.029) after controlling for effort (p<0.001)



Experiment 2

Participants: 250 undergraduate students from UCSD, all native Mandarin speakers.

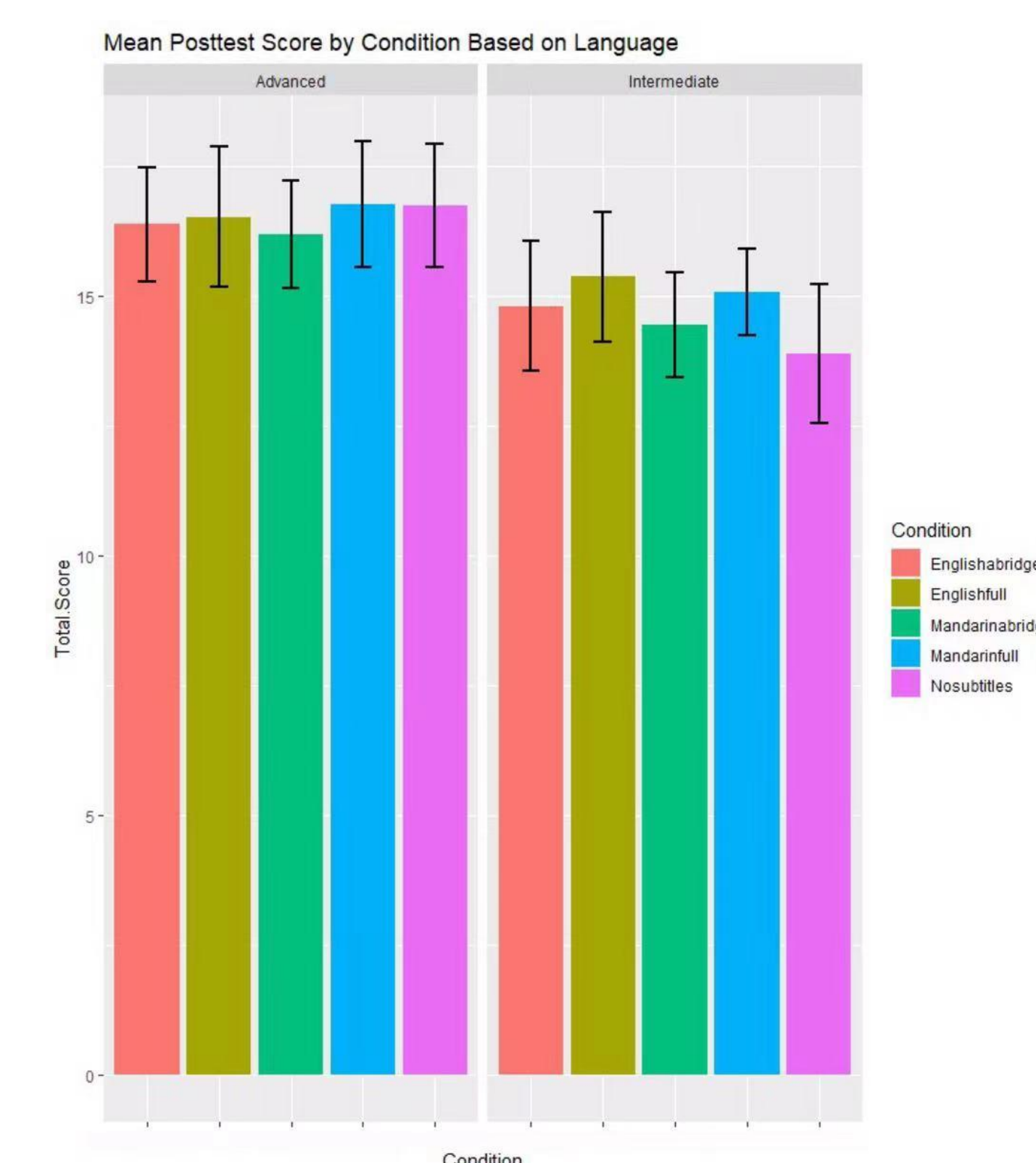
Materials - same lesson as Exp 1 but with animations removed (images as a slideshow)

Hypotheses:

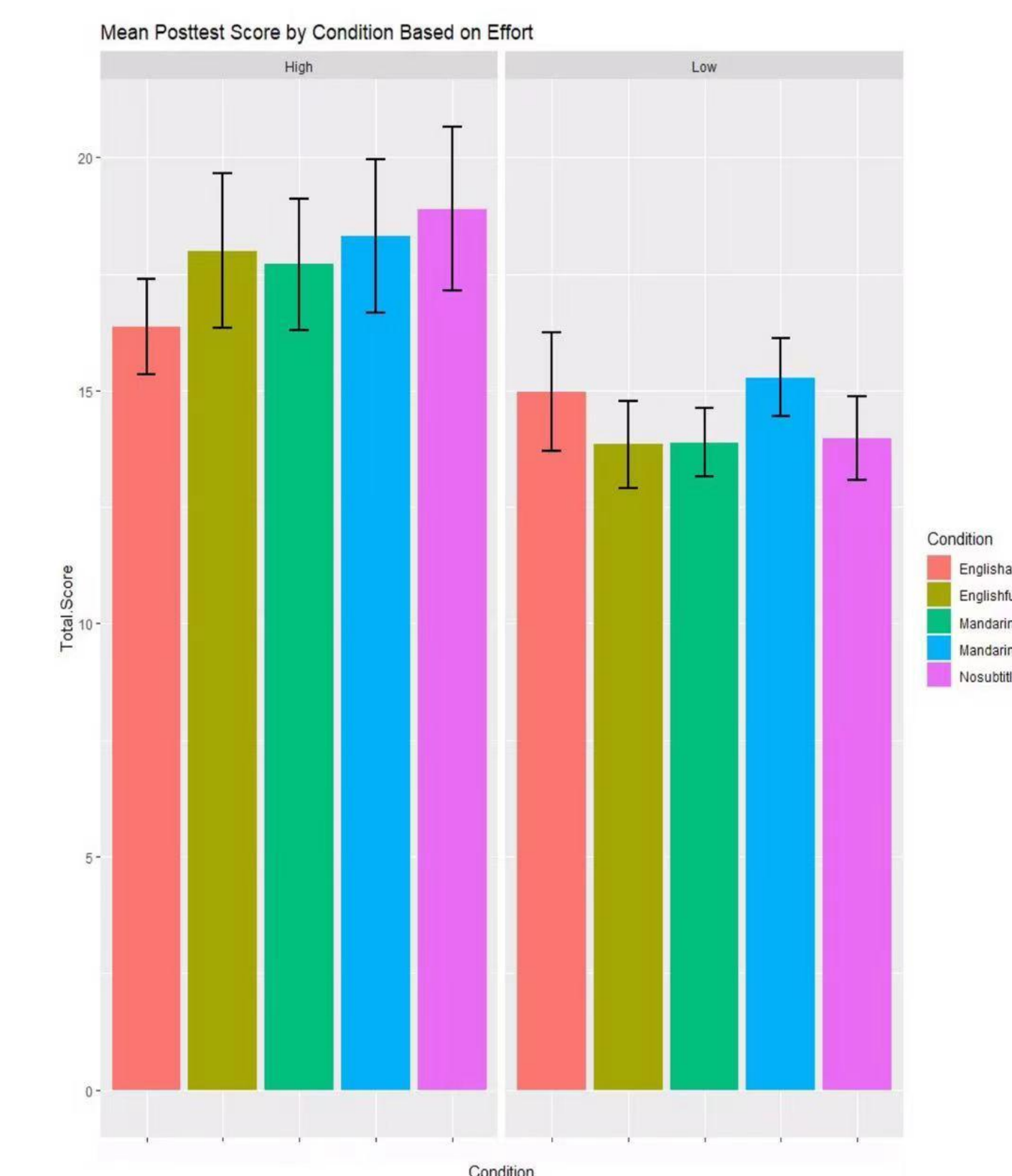
1. Abridged > Control > Full subtitles
2. For high English proficiency, English = Mandarin
3. For low English proficiency, English ≠ Mandarin

Results:

No main effect of Subtitles condition and no interaction with Proficiency



Significant effect of effort (p<0.001), but no significant effect of language



Discussion

Results (Experiment 1 and Experiment 2)

- No statistically significant relationship between language of subtitles and participants' learning outcomes.
- No statistically significant relationship between length of subtitles and participants' learning outcomes.
- No statistically significant difference between the performance of the control group and the four experimental groups.

Implication

Subtitles neither impair nor benefit learning in multimedia instructions. Students can turn on subtitles if they would like and subtitles will not distract students or reduce learning. Subtitles themselves may not impact learning beyond making the material more accessible.

Limitations

- **Remote format** - participation was not monitored by any researcher and there was no time limit.
- **Native Mandarin speakers** - presenting subtitles in languages similar to English may yield different results, as processing two dissimilar languages might require extra processing.
- **English proficiency** - nearly all participants reported to be proficient in English - potential effects of subtitles for EFL students who are less proficient?
- **Floor effects** - low mean posttest for Exp 1 (14.2) and Exp 2 (15.7), both out of 51 - maybe the lesson and/or the posttest was too difficult?

References

- Mayer, R. E., Lee, H., & Peebles, A. (2014). Multimedia learning in a second language: A cognitive load perspective. *Applied Cognitive Psychology, 28*(5), 653-660.
- Moreno, R., & Mayer, R. E. (2002). Verbal redundancy in multimedia learning: When reading helps listening. *Journal of educational psychology, 94*(1), 156.
- Yue, C. L., Bjork, E. L., & Bjork, R. A. (2013, March 18). Reducing Verbal Redundancy in Multimedia Learning: An Undesired Desirable Difficulty?. *Journal of Educational Psychology*. Advance online publication. doi: 10.1037/a0031971