The impact of the visual cues on listening comprehension process and performance: An eye-tracking study

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Aims & Rationale

- As we are accustomed to accessing information through moving images, video has now become a 'prime source of content' (Apkon, 2013) but its use in language assessment has remained tentative.
- Studies have explored the effect of visuals in a listening test, mainly by comparing scores between audio and video-based tests (Cubilo & Winke, 2013; Suvorov 2009; Wagner 2010), and examining how candidates interact with visuals in video-based listening tests (Ockey, 2007; Suvorov, 2015; Wagner, 2013).
- No studies have yet provided solid evidence on the effect of specific visual cues on candidates' listening comprehension process and performance.
- To address this gap, this study aims to investigate the impact of visual cues as listening comprehension test input.
- To validate the implementation of visuals as part of listening comprehension input, this study aims to explore the extent to which the candidates' viewing behaviours during the test are associated with their listening comprehension process and performance.

Research Questions

RQ1. To what extent do visual cues in a video-based listening comprehension test have an effect on language learner's listening performance?

RQ2. Is level of proficiency a significant factor in determining whether candidates benefit from the visual aids in the video-based listening input? Which proficiency group (low, central, and high) benefits the most and the least from the visual cues?

RQ3. To what extent does candidate's individual variability in viewing behaviour associate with their listening test performance in audio-only and video conditions? Does this relationship vary by the item and candidate characteristics?

RQ4. To what extent does candidate's use of cognitive and metacognitive strategies have an effect on their listening comprehension? Does having a visual input make significant differences to this?

Participants

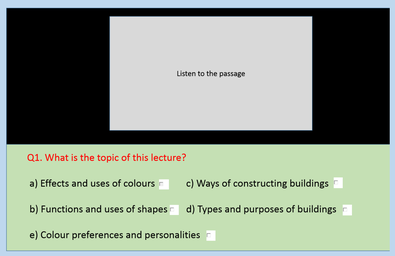
- Approximately 100 grade 11-12 high school students in Republic of Korea
- Typical EFL learners, low-to-intermediate level
- Received English instructions as a compulsory subject in elementary and secondary education but opportunity to use English outside the classroom is very limited

Research Materials

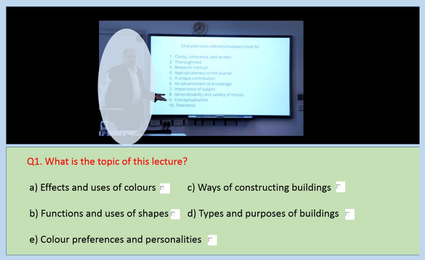
Test Materials: retired items of CSAT, Mock CSAT, and NELT between 2012 and 2016
- CSAT: College Scholastic Ability Test, high-stake university entrance exam
- Mock CSAT: a mock exam for potential CSAT candidates to prepare for the exam
- NELT: National English Listening test administered twice a year to measure listening skills
- Total **15 items** selected and revised to form a set of listening test
- **Piloting** of the test material: **Crombach's Alpha reliability coefficient of .88 found**
- Developed on a CBT format (PPT slides); multiple-choice format with 5 options

Eye-tracking instrument: Tobii X2-60 installed on a laptop computer, analysed by Tobii studio

Questionnaire: Cognitive & metacognitive strategy-use questionnaire
- 28 five-point Likert scale items (adapted from Phakiti, 2007, 2016)

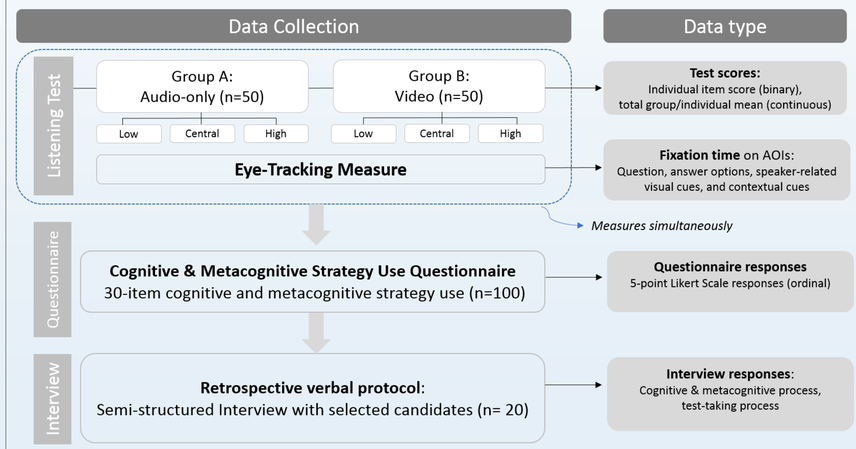


Audio-only

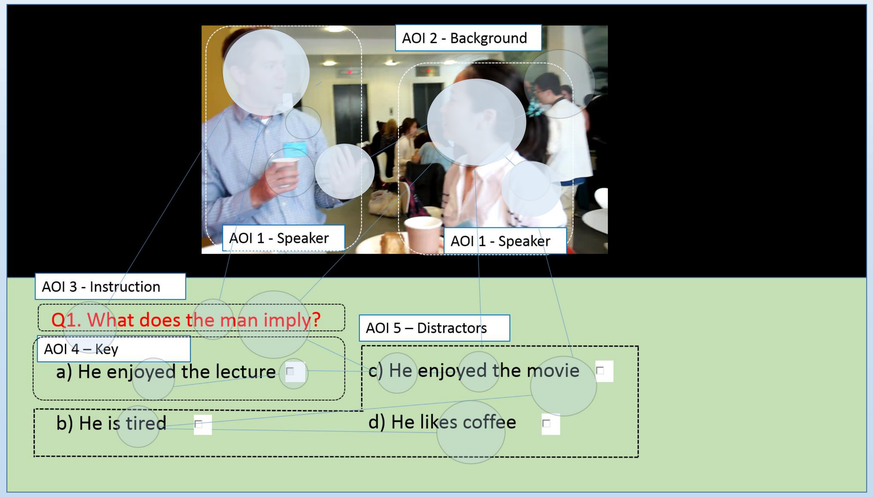


Video

Data Collection Procedure



Areas of Interests for Eye-tracking measure



Data analysis: Test score

To examine the main effect of the video (RQ1):
- Independent t-test on test scores between group A and group B

To examine if the main effect varies by the proficiency levels (RQ2):
- Multiple linear regression with 2 fixed parameters and 1 interaction variable:

$$Score_i = ß_0 + ß_1\underline{Video_i} + ß_2\underline{Proficiency_i} + ß_3\underline{Video \times Proficiency_i} + e_i,\ e_i \sim N(0, \sigma^2)$$

dummy — categorical — interactional

↓ effect of video ↓ effect of proficiency level ↓ interaction effect

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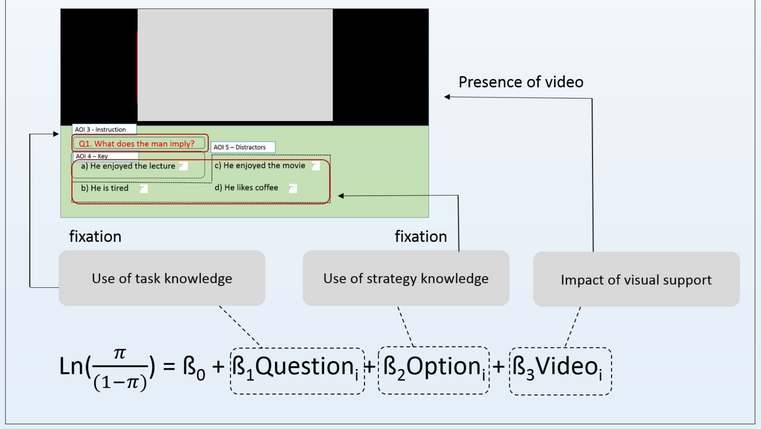
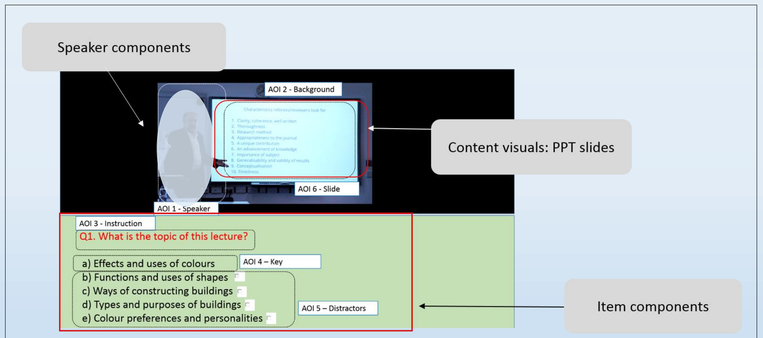
Logistic regression with eye-movement data (RQ3)



$$Ln(\frac{\pi}{(1-\pi)}) = ß_0 + ß_1 Question_i + ß_2 Option_i + ß_3 Video_i$$



$$Ln(\frac{\pi}{(1-\pi)}) = ß_0 + ß_1 Speaker_i + ß_2 Background_i + ß_3 Item_i + ß_4 Slide_i$$

Cross-classified multilevel model (RQ3)

$$Logit(\pi_i) = ß_0 + ß_1 Question_i + ß_2 Option_i + ß_3 Video_i + u^{(2)}_{item(i)} + u^{(3)}_{candidate(i)} + e_i$$

$$u^{(3)}_{candidate(i)} \sim N(0, \sigma^2_{u(3)})$$

$$u^{(2)}_{item(i)} \sim N(0, \sigma^2_{u(2)})$$

$$e_i \sim N(0, \sigma^2_e)$$

Questionnaire analysis (RQ4)

- Factor analysis on responses to 28 items
- Multiple linear regression model with factors and video fitted:

$$Score_i = ß_0 + ß_1 Factor1 + ß_2 Factor2 + ß_3 Video + ß_4 Video*Factor1 + ß_5 Video*Factor2 + e_i,\ e_i \sim N(0, \sigma^2)$$

Retrospective verbal report analysis (RQ3 & RQ4)

- Thematic Analysis (Braun and Clarke, 2006): selecting, focusing, and simplifying (Miles, Huberman, & Saldana, 2013)
- To provide rationales for certain test-taking behaviours as supporting evidence to the quantitative findings