

Synchronisation of eye tracker data with other data

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The Experiment

■ **Research Questions**

- What's the influence of cognitive load and emotional reactions on reading performance?
- How works our measuring system (feasibility)?

■ **Subjects**

- 103 college students (Fachmittelschule; *access to universities of applied sciences*)
- Average years: 17.8 (1.2); range: 16-21
- 87% women

■ **Instruments**

- Cognitive load: **Eye Tracker SMI RED500**, Single Items
- Emotional reaction: **FaceReader 6.1** (Noldus), **E4 Empatica**, Single Items, Questionnaires

■ **Conditions**

- Screen size: small (smartphone) – middle (tablet) – large (laptop); randomized
- Text difficulty / readability: 'easy' – 'difficult'; randomized
- Emotional content: neutral – negative – positive



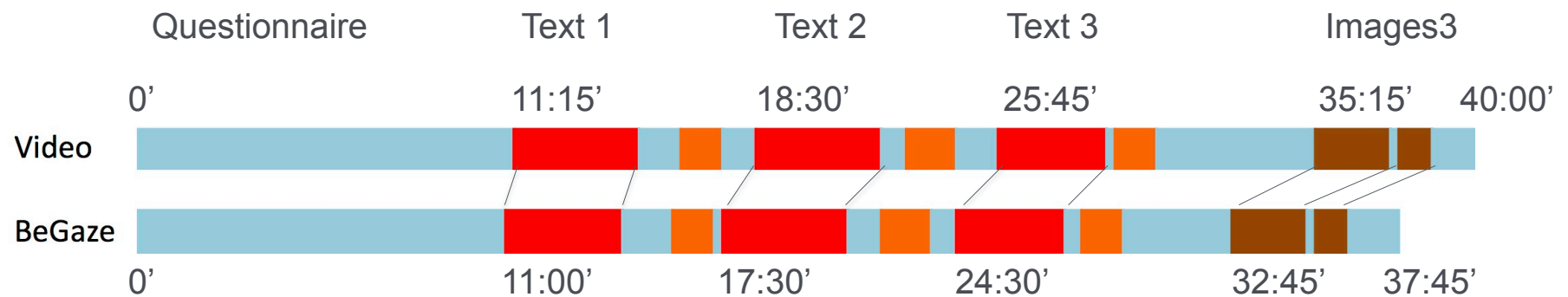
3

The Design

1. Welcome and informed consent
2. Preparation
3. Questionnaire (biography, reading practice, mood, empathy)
4. Phase 1
 1. Text 1 (neutral)
 2. Retelling 1
 3. Single questions (valence-arousal, difficulty, knowledge)
5. Phase 2
 1. Text 2 (negative)
 2. Retelling 2
 3. Single questions (valence-arousal, difficulty, knowledge)
6. Phase 3
 1. Text 3 (positive)
 2. Retelling 3
 3. Single questions (valence-arousal, difficulty, knowledge) + Questionnaire (mood)
7. Images faces (anger, contempt, disgust, fear, happiness, sadness, surprise)
8. Images nature (landscapes, snakes, spiders)
9. Single questions (valence-arousal, liking landscapes, snakes, spiders)
10. Discharge



The Problem



BeGaze (software to visualize eye tracker data of SMI) **cuts out loading times** and times when the eye tracker does not measure



Our Solutions

- Experiment 1 (cognitive task; *not shown before*):
 - **Event data** did not work because (even if video duration and last event correspond well)
 - Video: **reflected screen brightness** on the face or clothes of the subjects (split second)

- Experiment 2:
 - **Event data**: did not work because reading stark was different (questions to experimenter, orientation behaviour, ...)
 - **BeGaze**: Timeline of first (and last) fixation on text: did not work
 - Video: **reflected screen brightness** on the face or clothes of the subjects
 - Texts and retelling: to the split second (Quick Player 10, VLC)
 - Images (faces, nature): frame (Quick Player 7)
 - With the help of BeGaze data and a second (not synchronized) video showing back of subject and screen



Your Solutions?

- Do you have problems synchronizing eye tracker data with other data?
- What are your solutions to synchronize eye tracker data to other data? (FaceReader, physiological data)
- Are there some simple or automated solutions?

Thank you

