SUBTITLING PROCESS RESEARCH

Eye Tracking & The Process of Subtilling

ABSTRACT

We conducted an eye tracking study with professional subtitlers and subtitling trainees producing interlingual (English to Polish) and intralingual (SDH) subtitles. No TPR study to date has been concerned with the process of subtitling. Data was collected using eye tracking, keystroke logging, screen recording and semi-structured interviews. The participants received the video, the transcription of the English dialogues, subtitling guidelines concerning the length and duration of subtitles and were allowed to use the Internet. The data make it possible to explore the different stages of the subtitling process and the time spent on each task, and to compare the techniques used by subtitling trainees and professionals when they face translation problems.

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BACKGROUND

Translation process research & human-computer interaction

• Motivation to quantitatively study the process of translation aiming at the possibility of triangulating quantitative and qualitative data in order to test the researcher's hypotheses (Jakobsen 1998)

Subtitling process

- Processing of the audiovisual material: visual and verbal inputs
- Comprehension of the original and the production of the target text might be affected by the audio channel

03 PRELIMINARY RESULTS

Task completion time

Trainees spent 39% more time on subtitling and 56% more time on SDH

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Key presses and mouse clicks

EZTitles

Clicks/total Clicks Key presses events

- "Translation process research has started to ask questions about the usability and suitability of these [translation memory] tools for the translation process" (O'Brien 2015)
- A general interest has been put on the way how translators interact with translation tools (O'Brien 2008)
- Translation expertise as an acquired skill involving proceduralization, self-regulation, and metacognition (Shreve 2006)
- Discourse processing during simultaneous interpreting (Ivanova 1999)
- Potential for pedagogical initiatives (Hvelplund 2016)
- Technological competence: how to use a particular translation tool (EMT competences)

- Source text transcription
- Specialized software
- Documentation processes: dictionaries, websites
- Unlike other translators, au normally do not use TM/M
- Subtitle segmentation is de unlike regular TM segment



DESIGN AND METHODS

PARTICIPANTS

• 12 professional translators



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POTTING AND TRANSLATION

ainees: independent **spotting** and **translation** stages in the workflow

VISION

- Trainees: several revision rounds

• 6 translation trainees

DATA COLLECTION METHODS

- Eye tracking: SMI Red Mobile 250 Hz
- Screen recording
- Key and mouse logging
- Pre-experiment questionnaires
- Semi-structured interviews





INTERLINGUAL SUBTITLING

- English to Polish
- 85-second excerpt



EdList

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otheses

- . TASK COMPLETION TIME
- Professionals will have a lower task completion

P02 12 20.2% P04 17 22.5% N01 14 11.8% N02 9.5% 11

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- Online dictionaries and Wikipedia were the resources most commonly used by the participants.
- Wikipedia was used by professionals and trainees alike. Only one professional used ProZ.
- Participants used Google as a corpus to confirm their decisions and as a tool to find other pages. They rarely visited a website directly by inputting the URL.

• Professionals: only one round or the revision of specific parts of the clip

VISUALIZATION

- Trainees: all
- Professionals: only 3



04 REMARKS & CONCLUSIONS

TASK COMPLETION TIME

- Professionals have a shorter task completion time owing to higher technological competence.
- · Professionals are faster as they rely less on the mouse. They show a higher degree of expertise in mastering the tool.

TEXT REDUCTION

Research-oriented teaching

Showing students screen recordings of the subtitling workflow has the potential to make them conscious of the decision-making process involved in subtitling. This gives them real-life information about how subtitlers solve problems in various ways and how long it took them to decide on a solution.

time

- American TV series The Newsroom
- English transcription was provided
- Tasks: translation and spotting INTRALINGUAL SUBTITLING (SDH)
- SDH in Polish
- 120-second excerpt
- Polish TV series Hotel 52
- No script provided

2. TEXT REDUCTION

- Professionals will have a higher text reduction
- ratio in the interlingual subtitling task
- 3. WORKFLOW
 - Professionals will use more specialized online resources
 - Professionals and novices will have a different worklow
- Even considering the trainees had had only three months of subtitle training at the time of testing, text reduction was similar among trainees and professionals.

WORKFLOW

- Trainees have a more segmented workflow, with well-defined stages, while professionals do not separate the stages of the subtitling process.
- Both groups use similar resources (Google, Wikipedia).

Further analyses

- Detailed analysis of the workflow and subtitling styles based on key presses
- Statistical analysis of eye-tracking data to assess cognitive effort, attention shifts and the distribution of cognitive resources during the subtitling task
- Problem-solving applied strategies by professionals and trainees at challenging points of the video

References

• Hvelplund, KT. 2016. Eye tracking and the process of dubbing translation. In J Díaz-Cintas & K Nikolić (Eds.). New Pursuits in Audiovisual Translation. • Jakobsen, A. L. 1998. Logging time delay in translation. In G. Hansen (ed.). LSP Texts and the Process of Translation. Copenhagen: CBS. 73-101.

• O'Brien, S. 2015. The borrowers. Researching the cognitive aspects of translation. In M. Ehrensberger-Dow, S. and expertise. Journal of Translation Studies 9(1): 27–42. Göpferich, S. O'Brien (Eds.). Interdisciplinarity in Translation • Ivanova, A. 1999. Discourse Processing during and Interpreting Process Research, vol. 72. Amsterdam: John Benjamins Publishing Company. 5–17. • O'Brien, S. 2008. Processing fuzzy matches in translation memory tools: An eye-tracking analysis. In Looking at Eyes: Eye Tracking Studies of Reading and Translation *Processing* 36. 79–102.

• Shreve, G. M. 2006. The deliberate practice: translation Simultaneous Interpreting: An Expertise Approach. Ph.D Thesis, University of Cambridge.

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