

# SUBTITLING PROCESS RESEARCH

# Eye Tracking & The Process of Subtitling

## 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.

David Orrego-Carmona  
Department of Linguistics and Language Practice  
University of the Free State, South Africa

Łukasz Dutka  
Agnieszka Szarkowska  
Institute of Applied Linguistics  
University of Warsaw, Poland

## 01 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)
- "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)

### 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
- Source text transcription
- Specialized software
- Documentation processes: consultation of dictionaries, websites
- Unlike other translators, audiovisual translators normally do not use TMMT
- Subtitle segmentation is defined by the subtitler, unlike regular TM segmentation



## 02 DESIGN AND METHODS

### PARTICIPANTS

- 12 professional translators
- 6 translation trainees

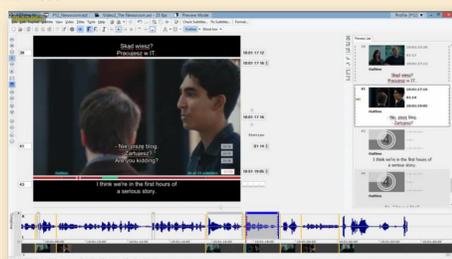
### DATA COLLECTION METHODS

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

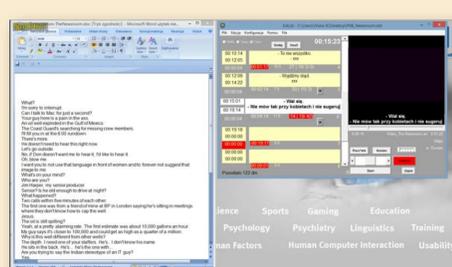


### Software

#### EZTitles



#### EdList



### Studies

#### INTERLINGUAL SUBTITLING

- English to Polish
- 85-second excerpt
- 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

### Hypotheses

#### 1. TASK COMPLETION TIME

- Professionals will have a lower task completion time

#### 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 workflow

## 03 PRELIMINARY RESULTS

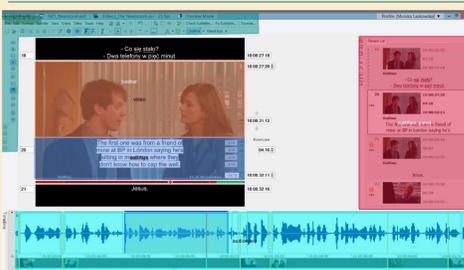
### Task completion time

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

	Subtitling (mins)		SDH (mins)
	EZTitles	Edlist	EZTitles
Professionals	55 (SD 18.38)	67.33 (SD 26)	19 (SD 6.52)
Trainees	77 (SD 10.07)	-	43 (SD 5.65)

### Mean fixation duration/AOI

	Toolbar	Internet	Audiowave	Sub. panel	Subtitles	Video
P02	164.1	185.4	144.4	148.6	144.6	156.2
P04	206	203.2	184.4	186.6	198	198.3
N01	205.8	222.7	157	165.6	167.9	187.9
N02	172.9	174.5	151.2	146.3	143.6	145.9



### Internet use and resources

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

- 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.

### Key presses and mouse clicks

#### EZTitles

	Clicks	Key presses	Clicks/total events
--	--------	-------------	---------------------

#### INTERLINGUAL SUBTITLING

Professionals	273	5411	4%
Trainees	489	4307	10%

#### SDH

Professionals	201	2086	8%
Trainees	135	2950	4%

#### Edlist

	Clicks	Key presses	Clicks/total events
--	--------	-------------	---------------------

#### INTERLINGUAL SUBTITLING

Professionals	1313	2486	35%
---------------	------	------	-----

### Text condensation

	Words	Characters
Original	354	1178
Professionals	218 (SD 11.45)	1231
Trainees	225 (SD 6.10)	1240

### Subtitling workflow

#### SPOTTING AND TRANSLATION

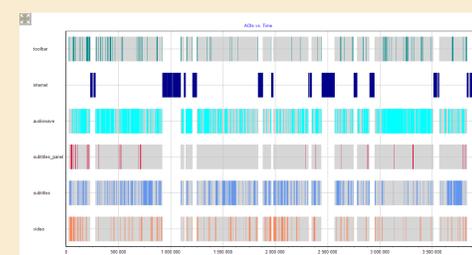
Trainees: independent **spotting** and **translation** stages in the workflow

#### REVISION

- Trainees: several revision rounds
- 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

- 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).

### 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.

### 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 strategies applied by professionals and trainees at challenging points of the video

## References

• Hvelplund, K.T. 2016. Eye tracking and the process of dubbing translation. In J Diaz-Cintas & K Nikolic (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. Göpferich, S. O'Brien (Eds.), *Interdisciplinarity in Translation 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 and expertise. *Journal of Translation Studies* 9(1): 27–42.

• Ivanova, A. 1999. Discourse Processing during Simultaneous Interpreting: An Expertise Approach. Ph.D Thesis, University of Cambridge.

## Contact

OrregoJD@ufs.ac.za  
lukasz.dutka@uw.edu.pl  
a.szarkowska@uw.edu.pl

Audiovisual Translation Lab  
www.avt.ils.uw.edu.pl

Many thanks to Neurodevice for providing us with equipment and assistance in this study.

