**Draft Labor setting:**

***5.2. Laboratory setting (1 – 1.5 pages)***

1. **Describe the experimental approach and paradigm that will be used for assessing cognitive load in SIs and translators. Also mention the purpose of the two control conditions**
2. **Arrange 1 (!) figure of the tasks used in the SIs and translators**
3. **Describe the methods that we will use to quantify cognitive load and how these methods will be compared to provide a full picture of cognitive load**
4. **Describe the conditions that will be compared and which factors can be isolated using such an approach (see also some parts on that in the discussion section).**
5. **For EEG, have a look to these papers:**

**-Using Electroencephalography to Measure Cognitive Load**

**-Sensitivity of human EEG alpha band desynchronization to different working memory components and increasing levels of memory load**

**-Neurophysiological measures of cognitive workload during human–computer interaction**

**-EEG alpha and theta oscillations reflect cognitive and memory performance: a review and analysis**

**Stress, heart rate and EDA**

**PHYSIOLOGICAL STRESS DURING SIMULTANEOUS INTERPRETING: A COMPARISON OF EXPERTS AND NOVICES**

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Two different experimental procedures were set up to measure workload in a laboratory setting. The first one focusses on auditory processing during interpretation and therefore the recruited interpreters all will get through this setting. Visual processing during translation is the pivotal interest of the second procedure. Hence the expert-group for this setting are the translators. Multilingual controls will complete the sample in both procedures.

For the interpreters, the experimental procedure will be composed of the following modules: psychometric assessment, listening task, shadowing task, interpretation task. Participants have to face two different texts. One will be presented in ELF and the other in SE. Both texts are played auditorily and the order as well as the condition (ELF/SE) were randomized across subjects. To get a more detailed look into the multiple necessary task during an interpretation, we split the process into three parts. During the listening task, we aim to be able to detect differences elicited by the processing of auditory text input. The measurements of this task allows us to see, if there are already differences between groups at this stage of the interpretation process. The same analysis can be applied to the two different conditions (i.e. the ELF text vs. the SE text). The main focus of interest will be the measurement of workload through the assignment of a theta/alpha ratio. This ratio combines two different workload estimates and is said to be more sensitive than just the absolute power values of frontal theta or parietal alpha frequency band (Holm, Lukander, Korpela, Sallinen, & Müller, 2009). The representation of workload in the two frequency bands were first described by Gevins as follows (Gevins, Smith, McEvoy, & Yu, 1997). A high power value for the frontal midline theta band comes in line with high experienced workload (i.e. (Cavanagh & Frank, 2014; Doppelmayr, Finkenzeller, & Sauseng, 2008; Sammer et al., 2007)). In contrast, a high value in parietal alpha power is an indicator for low mental workload (i.e. (Klimesch, 2012; Moran et al., 2010)). In conclusion: The higher the value of the theta/alpha ratio, the higher the workload. Additionally, HR measurements should complement the EEG data on workload. A shorter inter-beat interval (IBI) was shown to correlate with higher cognitive demands (Fairclough, Venables, & Tattersall, 2005). We will compare the averaged IBI of the ELF listening task with the SE listening task to have an indicator whether ELF induces higher cognitive workload even when the participants are solely listening to a text. Measurement of the Galvanic Skin Response (GSR) rounds up the investigation of workload during the listening task. We here expect higher skin conductance during the ELF-listening compared to the SE-listening, because higher workload is associated with higher skin conductance (Mühl, Jeunet, & Lotte, 2014).

Beside the listening task, we compare the above mentioned workload measures during the shadowing task. Here the vocalization is added to the processing of heard text input. At last, the interpretation task adds the translation component and similarly like during the listening task, workload investigation can be performed.

The experimental setup for the translators is similar to the above described insofar, as like in the interpreters setting an input- and an output-control task are implemented. Again, two different texts in the two conditions ELF and SE are presented. To control for differences due to the processing of visual input, participants are asked to read the two texts. Meanwhile, EEG as well as eye-tracking data will be collected. After that, the translators have to either copy or translate the input text for a duration of 6 minutes. The order of these two tasks is randomized across subjects. After an intermediate lexical decision task, the texts will be presented again but in the different condition. This is due to the fact, that everyone’s reading speed differs across participants. With both SE and ELF reading data from every translator, differences in fixation time, pupillometry or reading speed between the two conditions can be addressed for each person in addition to the above described theta/alpha ratio.