Performing multiple tasks simultaneously, such as listening to someone while driving, uses more cognitive resources than performing these tasks separately. In the case of language comprehension, individuals differ in the capacity of the channel through which incoming information is processed (Rabbitt, 1968). In general, high-density information (i.e., an unexpected word) will place a larger burden on the channel than low-density information. The risk of the channel being overloaded is especially high when its capacity is reduced by performing a secondary task or in individuals with lower cognitive capacity.

Previous work on multitasking abilities in coordinating language comprehension and driving applied the Index of Cognitive Activity (ICA), which measures rapid increases in pupil size, as an indicator of cognitive load (e.g., Demberg et al., 2013). The ICA was found to increase when information density in the linguistic input was higher and when driving was more difficult. However, contrary to expectation, the overall ICA level decreased in a driving and language comprehension dual task compared to single-task driving. To replicate this finding and to further investigate how the ICA reacts to cognitive load, we systematically test additional dual-task combinations, combining both language comprehension and driving with a memory task. In addition, we will assess individual differences in working memory to explore whether the increase in the ICA in various dual-task situations is restricted to individuals with lower working memory capacities. We present data from an experiment with young adults, which will later be supplemented by data from elderly adults.