

# Temporal Eye-Voice Span as a Dynamic Indicator for Cognitive Effort During Speech Processing: A Comparative Study of Reading Aloud and Sight Translation



Hao Zhou, Yu Weng , and Binghan Zheng

**Abstract** This chapter examines the dynamic latency between human translators' reading input and speaking output during reading aloud and sight translation. It aims to determine whether the temporal *eye-voice span* (EVS) at sentence level could work as a dynamic indicator of cognitive effort during speech processing. Thirty participants performed both the reading aloud and sight translation tasks with either English or Chinese texts. Their eye movements and speech outputs were recorded by an eye-tracker and an audio recorder, respectively. EVS at sentence-initial and sentence-terminal positions in the reading aloud and sight translation tasks were analyzed. The results show that the lengths of both sentence-initial and sentence-terminal EVS in sight translation tasks are significantly longer than those in reading aloud tasks. This is in line with the total gaze fixation duration and fixation count results, which are closely related to cognitive effort. Further correlation tests show that both initial and terminal EVS yield a positive although weak correlation with the fixation indexes in the sight translation tasks, while discrepant results emerge in the reading aloud tasks. Hence, we suggest that temporal EVS can be used to discriminate different types of reading-speaking tasks and has the potential to serve as a dynamic indicator of cognitive effort during sight translation.

**Keywords** Eye-voice span · Eye-tracking · Sight translation · Reading aloud · Cognitive effort

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H. Zhou · Y. Weng · B. Zheng (✉)  
School of Modern Languages and Cultures, Durham University, Durham D1 3JT, UK  
e-mail: [binghan.zheng@durham.ac.uk](mailto:binghan.zheng@durham.ac.uk)

Y. Weng  
e-mail: [yu.weng@durham.ac.uk](mailto:yu.weng@durham.ac.uk)

B. Zheng  
School of Foreign Languages, Shanxi University, Taiyuan 030006, China

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# Eye Voice Span

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