

Noise of Aircraft Flyovers Affects Reading Saccades

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Abstract : A number of studies show that aircraft noise around airports negatively affects the reading comprehension of children attending schools in the neighbourhood. Yet little is known about the underlying mechanisms. Explanatory approaches discuss the attention capturing effect of noise sources which occupy mental capacity. Research suggests that attentional capacities are especially demanded when different modalities are involved at the same time. To explore whether aircraft noise affects reading processes in specific manners, students read texts in variable sound conditions while their eye movements were recorded. Besides noise caused by aircraft flyovers, which represent moving sound sources, saccades were also recorded under the condition of white noise, a natural sound setting and silence for comparison. Data showed an increase in regressive saccades when the sound of moving sources was presented. Interestingly, this effect was significantly high when the aircrafts moved in the opposite of the reading direction. Especially the latter result is not compatible with the hypothesis of a general impairment of cognitive processes by noise where the direction of movement should not have an influence. Reading is assumed to be based on two different attentional mechanisms: overt and covert attention, where the latter supports control and pre-planning of eye movements during reading. We believe that covert attention is affected by moving sound sources, resulting in an enhanced number of backwardly directed saccades.

Keywords : aircraft noise, attentional processes, cognition, eye movements, reading saccades

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