



STUDIES IN THE RESEARCH PROFILE BUILT ENVIRONMENT  
DOCTORAL THESIS NO. 6

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# Disruption of writing in noisy office environments

Marijke Keus van de Poll

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som försvaras offentligt onsdagen den 28 mars 2018  
kl 13.00 i Lilla Jadwigasalen (12:108), Högskolan i Gävle.  
Opponent är professor Stefan Wiens, Stockholms universitet.

Akademin för teknik och miljö  
Avdelningen för bygg-, energi- och miljöteknik  
Högskolan i Gävle

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# Abstract

The overall aim of the four experimental studies included in this dissertation was to investigate the influence of background speech on writing performance. In Paper I, a manipulation of speech intelligibility of background speech, by using the Speech Transmission Index (STI), revealed disruptive effects at lower STI values (i.e. with relative low speech intelligibility) than expected, based on an earlier developed model. This showed that writing is more sensitive to disruption from background speech than previously thought.

Experiment 1 in Paper II addressed the question whether the sound of babble, sound of water waves, or pink noise is the most effective and appreciated way of masking background speech to reduce its intelligibility and thereby its disruptiveness. Masking with babble was best. Experiment 2 in Paper II followed this finding up by showing that the disruption of writing by background speech is a function of the number of voices talking in the background - less voices, more disruption.

Paper III investigated the combined impact of background speech and task interruptions on writing performance. Background speech (which was played during the whole condition) after an interruption was expected to prolong the time it took to resume the same writing speed as before the interruption. This hypothesis was not confirmed, but participants' self-reports showed that the combination of task interruptions and background speech convey a particularly high workload.

Paper IV explored what role sound source location and individual differences (inattention, noise sensitivity and working memory capacity) play in the disruption of writing by background speech. Self-reports showed that speech in front of the individual was perceived as more distracting compared to speech from behind. Other results in the same study showed that high inattentive individuals profit more from less intelligible speech located behind them than attentive individuals and high noise-sensitive individuals were more distracted by highly intelligible background speech than by less intelligible background speech.

The most important and replicable finding in this dissertation is that writing fluency is very sensitive to disruption from background speech; a finding relevant for the design of open work environments. In work areas where writing is a common task, the aim should be to create quiet work areas.

**Keywords:** background speech, writing, speech intelligibility, Speech Transmission Index, masking, sound source location, working memory capacity, inattention, noise sensitivity, task interruptions