

Articles about Health & Learning Impacts of Aircraft Noise

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Effects of low intensity noise from aircraft or from neighbourhood on cognitive learning and electrophysiological stress responses.

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Abstract

The effects of low intensity noise on cognitive learning and autonomous physiological processes are of high practical relevance but are rarely addressed in empirical investigations. This study investigated the impact of neighbourhood noise (of 45 dB[A], n=20) and of noise coming from passing aircraft (of 48 dB[A] peak amplitude presented once per minute; n=19) during computer based learning of different texts (with three types of text structure, i.e. linear text, hierarchic hypertext, and network hypertext) in relation to a control group (35 dB[A], n=20). Using a between subjects design, reproduction scores, heart rate, and spontaneous skin conductance fluctuations were compared. Results showed impairments of reproduction in both noise conditions. Additionally, whereas in the control group and the neighbourhood noise group scores were better for network hypertext structure than for hierarchic hypertext, no effect of text structure on reproduction appeared in the aircraft noise group. Compared to the control group, for most of the learning period the number of spontaneous skin conductance fluctuations was higher for the aircraft noise group. For the neighbourhood noise group, fluctuations were higher during pre- and post task periods when noise stimulation was still present. Additionally, during the last 5 min of the 15 min learning period, an increased heart rate was found in the aircraft noise group. **Data indicate remarkable cognitive and physiological effects of low intensity background noise. Some aspects of reproduction were impaired in the two noise groups. Cognitive learning, as indicated by reproduction scores, was changed structurally in the aircraft noise group and was accompanied by higher sympathetic activity. An additional cardiovascular load appeared for aircraft noise when combined with time pressure as indicated by heart rate for the announced last 5 min of the learning period during aircraft noise with a peak SPL of even 48 dB(A). Attentional mechanisms (attentional control) like being threatened by passing aircraft approaching the airport, higher demands of selective filtering, and difficulties in changing cognitive strategies during noise are discussed as underlying mechanisms.** Copyright © 2011 Elsevier GmbH. All rights reserved.

Chronic aircraft noise exposure, stress responses, mental health and cognitive performance in school children.

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Abstract

BACKGROUND:

Previous research suggests that children are a high risk group vulnerable to the effects of chronic noise exposure. However, questions remain about the nature of the noise effects and the underlying causal mechanisms. This study addresses the effects of aircraft noise exposure on children around London Heathrow airport, in terms of stress responses, mental health and cognitive performance. The research also focuses on the underlying causal mechanisms contributing to the cognitive effects and potential confounding factors.

METHODS:

The cognitive performance and health of 340 children aged 8-11 years attending four schools in high aircraft noise areas (16 h outdoor Leq > 66 dBA) was compared with children attending four matched control schools exposed to lower levels of aircraft noise (16 h outdoor Leq < 57 dBA). Mental health and cognitive tests were group administered to the children in the schools. Salivary cortisol was measured in a subsample of children.

RESULTS:

Chronic aircraft noise exposure was associated with higher levels of noise annoyance and poorer reading comprehension measured by standardized scales with adjustments for age, deprivation and main language spoken. Chronic aircraft noise was not associated with mental health problems and raised cortisol secretion. The association between aircraft noise exposure and reading comprehension could not be accounted for by the mediating role of annoyance, confounding by social class, deprivation, main language or acute noise exposure.

CONCLUSIONS:

These results suggest that chronic aircraft noise exposure is associated with impaired reading comprehension and high levels of noise annoyance but not mental health problems in children.

Gauging the Impact of Noise on Children's Learning [about NYC schools]

John Farley | August 28, 2012 4:00

<http://www.thirteen.org/metrofocus/2012/08/gauging-the-impact-of-noise-on-childrens-learning/>