

Science for Environment Policy

Possible long-term effects of aircraft noise on children's cognition

Levels of aircraft noise experienced in primary schools might affect aspects of children's cognition, even several years after they have left the school, new research suggests. Researchers revealed that 15-16 year olds who had attended noisier primary schools six years earlier found aircraft noise more disturbing or annoying, even after accounting for aircraft noise at their current school.

Living in noisy environments has been linked to various negative impacts on [human health](#), with studies showing associations with heart disease, sleep disturbance and stress. Across Europe, 80 million people, 20% of the total population, are thought to be regularly exposed to noise levels considered unacceptable by health experts.

A previous investigation into environmental noise's effects on children, the EU RANCH project¹, revealed negative effects of aircraft noise on several aspects of cognition, including reading comprehension and memory. RANCH studied 2844 children in 2001-2003, aged between nine and ten, attending 89 primary schools near major airports in the UK, the Netherlands and Spain.

The current study provides a follow-up to this work by assessing whether these effects on cognition were still apparent in the same children in 2008, when they were aged 15 to 16 and attending secondary school. Such 'longitudinal' studies, which follow individuals over long periods, are important to assess how the effects of noise change. For example, if children are not able to adapt to noise, its impacts on their cognition could increase over time.

This study focused on the UK children who had been part of the original RANCH study. 461 pupils were tested, and data on noise levels in the secondary schools as well as in their original primary schools were analysed.

The children were tested for reading comprehension, given a psychological distress score (based on answers to a questionnaire) and asked to rate how much aircraft noise disturbed or annoyed them. The researchers also accounted for other factors which may influence the results, such as socioeconomic background.

The results showed that noise annoyance was significantly related to noise levels that the teenagers had experienced when they were younger at primary school, even when the levels at secondary school had been taken into account. Annoyance can be an important indicator of a poor quality of life, the researchers state, potentially leading to stress and associated illness.

Poorer reading comprehension scores in the teenagers were associated with higher noise levels at primary school. While this finding was not statistically significant, the researchers suggest that this may be a result of the relatively small number of people studied, rather than a lack of an effect. Other, larger, studies have demonstrated a significant negative link between noise levels and reading comprehension. Finally, they found no association between higher noise levels at primary school and higher psychological distress scores.

Taken alongside the RANCH findings, the researchers conclude that this study adds to evidence that high levels of noise might impair children's cognitive development, particularly in terms of reading comprehension and noise annoyance.



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1.RANCH (Road traffic noise and Aircraft Noise exposure and children's Cognition and Health) project, was supported by the European Commission under the Fifth Framework Programme. See: www.wolfson.qmul.ac.uk/RANCH_Project