



Cognitive impairment caused by aircraft noise: school versus home

A recent study suggests that exposure to aircraft noise during the day has a greater impact on cognitive ability in children than sleep-disruption caused by exposure to aircraft noise during the night. Protective policy is therefore likely to be most effective if focused at the school level.

Two major pieces of research, the Munich¹ and RANCH² studies, have previously revealed a clear link between exposure to daytime aircraft noise and cognitive impairment in children, with comprehension and long-term memory skills most severely affected. However, these two studies did not address the impact of noise exposure at night.

Scientists have now revisited the data from both studies to determine whether the observed link between aircraft noise and impaired cognitive ability can be associated with quality of sleep.

In the original Munich study, 326 children were selected based on the proximity of their home to one of three major European airports: Schiphol (Amsterdam), Barajas (Madrid) and Heathrow (London). In the new study, the scientists analysed questionnaires given to the children at the time, in which they self-rated their quality of sleep.

The scientists found no clear link between the new data on sleep quality and the original analysis of cognitive ability. This indicates that although aircraft noise and cognitive impairment are closely related, in this case the effect cannot be linked to sleep disturbance.

A total of 857 children from a range of schools near London's Heathrow airport took part in the original RANCH study. The scientists used a statistical model to quantify the relationship between cognitive ability and the degree of noise exposure that the children experienced at school (daytime).

In the re-analysis, scientists compared the same cognitive performance data to information on night-time (23.00-07.00) noise exposure obtained more recently from the Civil Aviation Authority and matched to the children's home postcodes. Statistical analysis showed that the relationship between the extra variation among the children in terms of night-time noise and their cognitive performance was very weak (statistically non-significant).

These results suggest that disturbance of sleep caused by night-noise in addition to the noise level experienced at school alone does not affect the cognitive performance at school. The implication from this is that the contribution from day time noise is greater than the contribution from night time noise to the cognitive performance of children.

However, the scientists point out that this kind of secondary analysis does not allow separation into the independent effects of daytime and night-time noise, because they were highly correlated. Both showed a significant influence on child's cognitive performance; only the additional impact of night-time noise relative to daytime noise could be investigated. They therefore recommend *dedicated* research to quantitatively assess the effect of night-time noise on cognitive ability, plus research into the reasons for why excess noise causes cognitive impairment.

1. Available from:
https://www.psychologicalscience.org/pdf/ps/children_airport_noise.pdf
2. UK Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study. Available from:
http://www.teamsofangers.org/publication/medical_journal_articles/Noise.pdf

Source: Stansfield, S., Hygge, S., Clark, C. & Alfred, T. 2010. Night time Aircraft noise and children's cognitive performance. *Noise and Health*. 12 (49): 255-262

Contact: s.a.stansfield@gmul.ac.uk

Theme(s): Environment and health, Noise

Opinions expressed in this News Alert do not necessarily reflect those of the European Commission

To cite this article/service: "Science for Environment Policy"; European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.