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The effects of aviation noise on learning to read

Aviation noise has an effect on the reading performance of children who are in the learning-to-read phase. The connection is linear: the higher the exposure, the greater the negative effect on development. In the second-grade children examined by the study, an increase of the continuous noise level (L Glossary) by ten decibels (L Glossary) delayed learning to read by one month.
An increase of the continuous noise level by 20 decibels led on average to a delay of two months. For the investigation area of the NORAH study, this means that the delay is around two months in the areas with the highest exposure to aviation noise.

What else has an influence on learning to read?

The NORAH Study not only investigated the effects of aviation noise on learning to read but also other factors whose influence on learning is known – for example German-language skills or the number of children's books in the home. This was the only way to determine exactly the extent of the effect of aviation noise on learning to read. With these data the scientists were also able to show that some of the factors investigated in the study had a greater impact than aviation noise on learning to read. For example, children who have a lot of books were four months ahead in reading

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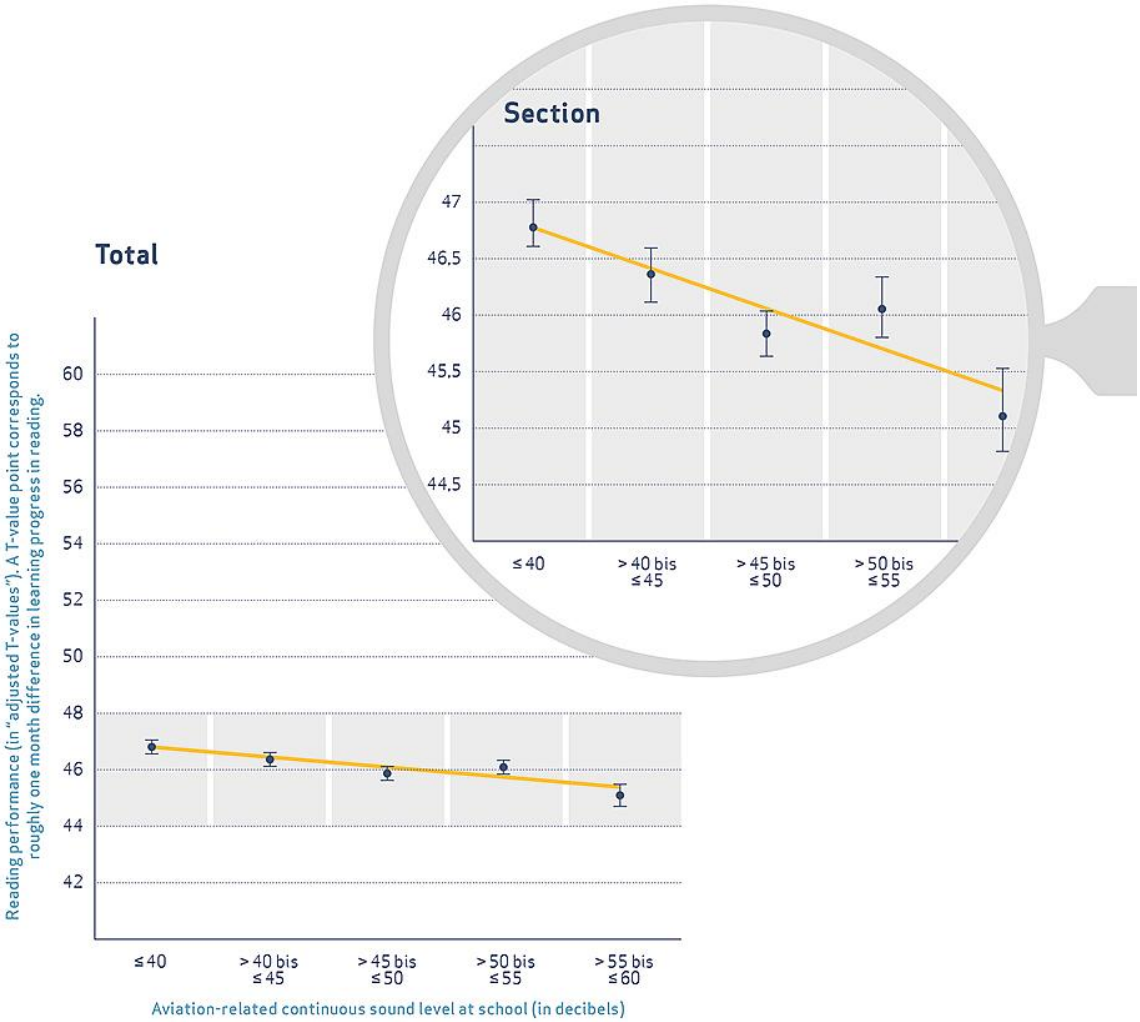
texts compared with children who do not own their own books. It is not possible to make a direct comparison here, however, because parents can decide themselves how much help they want to give their children in learning to read. They do not have any influence, however, on the aviation noise.



The graphs show the connection between noise exposure and overall reading performance. The higher the continuous noise level at the school, the lower the performance in the reading test. The vertical bars above and below the data points designate the range within which the estimated performance mean value lies with 95-% certainty. Left (total): Representation of the graph within the average range of the reading performance (40 to 60 T-value points). Right (section): Representation of a section between 44 and 48 T-value point corresponds to roughly one month difference in learning progress.

The NORAH scientists were unable to establish any statistically significant connection (L Glossary "Significance") between aviation noise and learning to read in children with a migration background. This result should not, however, lead to any hasty conclusions. The authors of the study suspect that it is due to a statistical effect: it is possible that there are so many factors confounded in this sub-

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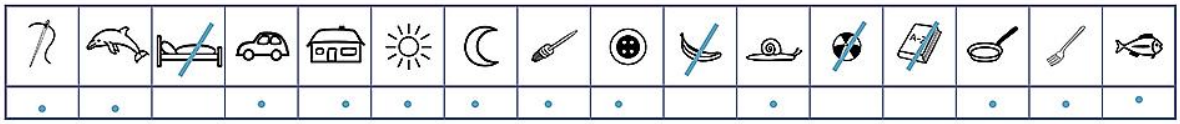
group that it was no longer possible to reliably identify effects of aviation noise. The result certainly does not mean that children with a migration background are insensitive to aviation noise.
If we look at only the children without a migration background, an increase of the continuous noise level by ten decibels led to a delay of 1.5 months in learning to read. This means that the difference between the children most exposed and the children least exposed in the investigation area was three months.



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In the so-called picture test, the children were asked to put a line through everything that begins with B (in German language), and mark all of the other pictures with a dot. This allowed the NORAH scientists to examine how quickly children can call up words from their memory and make a decision on the sound of the first letter (B or not B).

Still unknown: the reasons for the reading deficit

Up to now, researchers have not been able to explain exactly how aviation noise impairs the ability to learn to read. Some scientists suspect that the noise exposure has an effect on the development of the so-called precursor skills – skills that children acquire at a pre-school age. This includes for example "phonological awareness", which allows us to identify the sounds in words, and good listening comprehension. NORAH Study examined this thesis. The result: the scientists were unable to identify any link between aviation noise and the precursor skills.

Do you have any questions?

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