

## Publication

## The association of road traffic noise with cognition in adolescents: a cohort study in Switzerland

**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

ID 4659974

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Environmental noise exposure has been shown to affect children's cognition, but the concept of cognition is multifaceted, and studies on associations with noise are still inconclusive and fragmented. We studied cognitive change within one year in 882 adolescents aged 10-17 years in response to road traffic noise exposure. Participants filled in a comprehensive questionnaire and underwent cognitive testing twice at an interval of one year. Figural and verbal memory was measured with the Intelligenz-Struktur-Test (IST), and concentration accuracy and constancy were measured with FAKT-II and d2 test. Exposure to noise and other environmental stressors were modelled for school and home location at baseline. Missing data was addressed with multiple imputation. Cross-sectional multilevel analyses and longitudinal change score analyses were performed. In cross-sectional analyses, figural memory was significantly reduced by -0.27 (95%CI -0.49,-0.04) units per 10 dB road traffic noise increase at home (L(den)). Longitudinal analyses showed a significant reduction of concentration constancy Z-scores between baseline and follow-up by -0.13 (95%CI -0.25, 0.00) per 10 dB road traffic noise at home (L(den)). Our study indicates that road traffic noise at home reduces cognitive performance in adolescents. Larger cohorts with longer follow-up time are needed to confirm these results.

**ISSN/ISBN** 1096-0953**URL** <https://doi.org/10.1016/j.envres.2022.115031>**edoc-URL** <https://edoc.unibas.ch/92937/>**Full Text on edoc** Available;**Digital Object Identifier DOI** 10.1016/j.envres.2022.115031**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/36502901>**ISI-Number** MEDLINE:36502901**Document type (ISI)** Journal Article