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Analysis of everyday sounds which are extremely annoying for
children with autism

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Extreme sensitivity to noise is a problem that almost all autistic children suffer from. A sound that is extremely annoying does not need to be loud. However, the characteristics and temporal variations of these sounds are sparsely investigated. The aim of this study is to increase the knowledge about these extremely annoying sounds so they can be avoided by better design criteria for classrooms and venues like that. By interviewing teachers and parents a number of everyday sounds were identified and binaurally recorded. Examples are vacuum cleaners, ventilation noise, washing machines and pouring water. Detailed psychoacoustic analyses of this type of sounds were achieved by a listening test procedure in three parts. First 16 children composed different types of vacuum cleaner sounds trying to minimize annoyance in two different tests, a) keeping original sound pressure level. b) adjusting to acceptable loudness. In the second part, teachers working with autistic children performed a listening test to evaluate some of the composed sounds from part 1 and modified versions of them. The third part was performed by children to validate the results. The results showed that Roughness, Loudness and an index defined as High frequency tonality were the most important characteristics.