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Inhibitory control and noise sensitivity moderate the effects of listening conditions on academic tasks for primary school children

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ABSTRACT

Noise in the classroom is known to jeopardize the exchange of information from teacher to pupils and between the class members, and is also responsible for distraction and interference with the cognitive processes underpinning academic tasks. To test such effects both auditory and non-auditory tasks have been used, ranging from basic speech recognition of words to more complex verbal and non-verbal tasks, possibly resembling those effectively conducted in the classroom. By analyzing accuracy and effort data, knowledge has increased in the last years on the interplay of the physical factors (i.e. type of noise, reverberation etc..) and the cognitive demands of the tasks. However, less is known on how personal characteristics, such as inhibitory control and noise sensitivity, mediate the process. In this work a panel of 104 pupils from grades III, IV and V were administered three academic tasks (speech comprehension, mathematical reasoning, mathematical facts) in a noisy background by means of tablets and headphones. The tests took place in their classrooms and were carried out by the whole class together. The assessments of inhibitory control and noise sensitivity, were also accomplished, together with evaluations of task-specific competence. By statistical analysis it was possible to clarify the role of personal factors both on accuracy and effort for each task, and also to understand how motivation and confidence in doing the task can be influenced by the noisy context. This work adds evidence to the current models for the understanding of effort in noise conditions.

Keywords (3-6): Listening effort, Classroom acoustics, Motivation, Comprehension, Maths, Noise sensitivity