

MILD HEARING LOSS: AUDITORY PROCESSING

REFERENCE	DESIGN	RECRUIT-MENT	CASE DEFINITION	SUBJECTS	ASSESSMENT TOOLS	RESULTS	AUTHOR'S CONCLUSIONS
Bourland Hicks C, Tharpe A. Listening effort and fatigue in school-age children with and without hearing loss. J Speech Lang Hear Res. 2002;45(3): 573-84.	<i>Experiment 1:</i> 2 samples of salivary cortisol levels and 2 child-completed, self-rated charts designed to determine self-perception were compared. <i>Experiment 2:</i> Dual-task performance paradigm used to study listening effort.	Local school system and local hearing and speech center. Controls and subjects matched on academic performance and were from same classrooms.	PTA* .5, 1, 2, 4 kHz.* <i>Normal Hearing:</i> ≤15 dB* HL.* <i>Mild-moderate SNHL</i> *: ≥25dB and ≤70dB HL bilaterally. <i>High Frequency SNHL</i> : ≥25 dB and ≤70 dB HL bilaterally (2 or more frequencies above 1 kHz). No child had diagnosed learning disability or cognitive impairment.	<i>Experiment 1:</i> 10 children 5-11 years with mild-moderate hearing loss and 10 control children 5-11 years. <i>Experiment 2:</i> 14 children 6-11 years with mild-moderate hearing loss and control group of 14 control children 5-11 years. Experimental and control groups matched on academic performance and from the same classrooms; matched on peer relations because this is closely related to baseline cortisol levels.	<i>Experiment 1:</i> 2 samples of salivary cortisol levels obtained morning and afternoon on 2 days. After 2 nd sample on 1 st day, each child completed a series of 9 self-rated charts to determine self-perception. <i>Experiment 2:</i> Dual-task performance paradigm. Primary and secondary tasks performed simultaneously to determine whether children with hearing loss expended more listening effort under adverse conditions than control children. Primary task: Speech recognition testing in varying levels of background noise. Secondary task: pushing a button in response to random presentations of probe.	<i>Experiment 1:</i> Cortisol levels and self-perception tests between groups not significant. <i>Experiment 2:</i> Children with hearing loss had longer reaction times on secondary task than children with normal hearing. No difference between groups on false alarm rate (pushing a button with no probe) or miss rate. Children with normal hearing scored higher on primary task (word repetition) than children with hearing loss for all conditions including baseline.	Authors offered several reasons why there were no significant between-group differences in salivary cortisol. Children with hearing loss expended more effort in performing word-repetition task than control children. However, the 2 groups did not differ in their self-perceived effort ratings. Authors suggested children with hearing loss were at risk for expending greater effort listening in typical classroom environments than hearing children. Authors speculated that use of FM* systems could decrease listening effort.

* PTA = pure tone average; kHz = kilohertz; dB = decibel; HL = hearing level; SNHL = sensorineural hearing loss; FM = frequency modulated