

MILD HEARING LOSS: AUDITORY PROCESSING

REFERENCE	DESIGN	RECRUITMENT	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.	<p><i>Experiment 1:</i> 2 samples of salivary cortisol levels and 2 child-completed, self-rated charts designed to determine self-perception were compared.</p> <p><i>Experiment 2:</i> Dual-task performance paradigm used to study listening effort.</p>	<p>Local school system and local hearing and speech center.</p> <p>Controls and subjects matched on academic performance and were from same classrooms.</p>	<p>PTA* .5, 1, 2, 4 kHz.*</p> <p><i>Normal Hearing:</i> ≤15 dB* HL.*</p> <p><i>Mild-moderate SNHL*:</i> ≥25dB and ≤70dB HL bilaterally.</p> <p><i>High Frequency SNHL:</i> ≥25 dB and ≤70 dB HL bilaterally (2 or more frequencies above 1 kHz).</p> <p>No child had diagnosed learning disability or cognitive impairment.</p>	<p><i>Experiment 1:</i> 10 children 5-11 years with mild-moderate hearing loss and 10 control children 5-11 years.</p> <p><i>Experiment 2:</i> 14 children 6-11 years with mild-moderate hearing loss and control group of 14 control children 5-11 years.</p> <p>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.</p>	<p><i>Experiment 1:</i> 2 samples of salivary cortisol levels obtained morning and afternoon on 2 days. After 2nd sample on 1st day, each child completed a series of 9 self-rated charts to determine self-perception.</p> <p><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.</p> <p>Primary task: Speech recognition testing in varying levels of background noise.</p> <p>Secondary task: pushing a button in response to random presentations of probe.</p>	<p><i>Experiment 1:</i> Cortisol levels and self-perception tests between groups not significant.</p> <p><i>Experiment 2:</i> Children with hearing loss had longer reaction times on secondary task than children with normal hearing.</p> <p>No difference between groups on false alarm rate (pushing a button with no probe) or miss rate.</p> <p>Children with normal hearing scored higher on primary task (word repetition) than children with hearing loss for all conditions including baseline.</p>	<p>Authors offered several reasons why there were no significant between-group differences in salivary cortisol.</p> <p>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.</p> <p>Authors suggested children with hearing loss were at risk for expending greater effort listening in typical classroom environments than hearing children.</p> <p>Authors speculated that use of FM* systems could decrease listening effort.</p>

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