ABSTRACT

The purpose of the study was to examine the effect of stimulus duration on tests of auditory pattern recognition in children and adults. Traditional pitch and duration pattern perception sequence tests were modified by shortening stimulus duration. Twenty-four normal hearing children and 30 normal hearing young adults participated. Traditional pitch and duration pattern sequence tests were administered. In addition, modified pitch and duration pattern sequence tests with shorter overall stimulus durations were administered. For the pitch pattern test, performance was significantly poorer (p < .002) with the shortened duration. Performance of adults was better than that of children on the duration tests only (p < .003). The fact that age did not significantly affect performance on the pitch pattern test would lead one to conclude that the maturational course of the neural mechanisms that mediate these different perceptual capacities (i.e., pitch vs. duration pattern recognition) have a different developmental time course. This study provides initial data for the application of short duration pattern perception tests for the assessment of auditory processing in clinical populations.

METHODS

Participants

Twenty-four normal hearing children from 10 - 14 years of age (M = 11.7; SD = 1.3) and 30 normal hearing adults from 19 - 39 year of age (M = 23.3; SD = 4.8) participated. Stimuli

Stimuli were presented at 70 dB pSPL. The table below details stimulus parameters for each test.

<table>
<thead>
<tr>
<th>Test Condition</th>
<th>Frequency (Hz)</th>
<th>Duration (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Pitch</td>
<td>1122/880</td>
<td>150</td>
</tr>
<tr>
<td>Shortened Pitch</td>
<td>1122/1000</td>
<td>75</td>
</tr>
<tr>
<td>Traditional Duration</td>
<td>1000</td>
<td>250/500</td>
</tr>
<tr>
<td>Shortened Duration</td>
<td>1000</td>
<td>75/25</td>
</tr>
</tbody>
</table>

Procedure

Following instruction/practice, 30 sequences were administered for each test condition. Listener reported verbally each pattern that was presented. All testing was conducted in a sound treated room. Order of test presentation was counterbalanced.

RESULTS

Percent correct scores for each test as a function of age group are displayed in Figures 1 and 2. Prior to inferential statistical analysis, proportional data were submitted to an arcsine transformation. With this in mind, the pattern perception sequence (PPS) tests (pitch and duration) were selected as the focus of the current study. Listeners of different ages simply by virtue of their sensitivity to one or a small set of variables underlying internal noise (p = .003, n² = .16). Children performed poorer than adults.

CONCLUSIONS

Musiek reported normative data for the compact disc versions of the pitch and duration pattern tests for young adult listeners. Mean scores were approximately 90% for both tests. In addition, 90% of participants scored at least 78 and 73% on the pitch and duration pattern tests, respectively, prompting a recommendation that the 78 and 73% values be used in determining if a listener falls within normal limits. In the current study, mean scores were above these values for both children and adults. As with the Musiek study, slightly better performance was observed on the duration pattern tests. The same was observed in the current study.

Performance of adults was better than that of children on the duration tests only. This in itself was not surprising considering the plethora of data documenting maturational effects/differences between adults' and children's performance on numerous tests of auditory function.

The fact that age did not significantly affect performance on the pitch pattern test was interesting. This finding would lead one to either conclude that maturational effects of the neural mechanisms that mediate these different perceptual capacities (i.e., frequency vs. duration pattern recognition) have a different developmental time course or "a refinement in the auditory ability may appear to emerge at different ages simply by virtue of their sensitivity to one or a small set of variables underlying internal noise" (p. 2786).

BIBLIOGRAPHY