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**Age-related changes in frequency discrimination:  
Tone duration and training can affect performance**

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The studies described were motivated by an observation that normally-developing 6-year-olds had difficulty on a frequency discrimination task originally developed to explore backward masking. A two-interval forced-choice paradigm was used, with each interval containing two tones, a target tone (either 400 Hz or a higher frequency) and a comparison tone (always 400 Hz). The task was to select the interval containing the higher frequency target tone i.e. the interval where the target and comparison tone differed. It was expected children might do poorly when the interval between the target and comparison tone was short, because of backward masking, but performance was poor even with an ISI of 320 ms. Two further studies investigated the reasons for this, and considered whether children needed more practice on the task, are impaired with brief target tones, and susceptible to masking at long ISIs. Frequency discrimination performance was examined in 6- to 9-year-old children and adults. In a two-interval forced-choice paradigm the target tones, one of 400 Hz and the other of higher frequency, were 50 or 150 ms in duration. Each target tone either preceded (study 1) or followed (study 2) a 200 ms comparison tone of 400 Hz by 320 ms. Frequency discrimination performance was further examined when target tones were presented alone. In all tasks, participants had to select the interval containing the higher-frequency target tone. Study 1 showed the 8- to 9-year-olds had significantly lower recognition thresholds on both durations over two sessions compared to the 6- to 7-year-olds. There were no significant differences between the adults and the older age group. There was a significant improvement in the younger age group during the second session on the 150 ms condition, but their performance remained poor, with average thresholds of around 516 Hz. Within each age group there was no significant relationship between language ability and frequency discrimination performance. In study 2, where the comparison tone preceded the target tone, there were no significant differences between age groups on the frequency discrimination tasks, and thresholds were substantially lower than in study 1. When target tones were presented alone, no significant differences were found between age groups. Frequency discrimination performance was found to correlate to varying degrees with language ability. The results of these studies suggest many 6-year-old children are susceptible to backward masking in a frequency discrimination task even with long ISIs of 320 ms.