

DEVELOPMENT OF MEMORY FOR SEQUENCES OF ANIMAL SOUNDS: RELATION TO DIGIT-SPAN AND LANGUAGE ABILITY

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Background

The ability to remember a sequence of sounds is crucial to many auditory tasks, such as speech production and recognition. Previously Cohen and O'Connor (1994), by means of a new computerized test, examined the development of memory for sequences of meaningful nonverbal sounds across four different age groups. Five readily identifiable animal sounds provided the test material. In the first block of test trials, a sequence of two animal sounds was presented. In successive blocks, additional sounds were presented to a maximum of five animal sounds. Listeners responded by pointing to the pictures of the animals in the order in which the sounds had occurred. Performance increased systematically with age and sound duration (250 vs 500 ms) and decreased with increasing number of sounds in the sequence.

Present Study

The present study aimed to replicate and extend these findings. The same test was administered to preschool children, primary school children, adolescents and young adults, with 10 children in each group. The pattern of Cohen and O'Connor's results was replicated with respect to age, sequence length, and duration. In addition, data on digit-span memory was obtained for each subject in this study. Digit span correlated significantly with performance, but left over 60% of the variance unexplained. Thus, the present task measures processes beyond those required for a test of auditory memory of numerical sequences, a test often used to assess auditory sequential memory.

Follow-up Study and Conclusions

In a follow-up study, the potential diagnostic potential of the present task was investigated. Nine children, 8 to 9 years of age, classified by their teachers as having language impairment (primarily reading) were compared on the animal sounds task, with 9 children having normal language abilities. Language impairment was associated with poorer performance in one condition of the test, the most difficult (5-sound) condition. This nevertheless suggests the sensitivity of the animal sound sequencing task to language impairment. It also supports the notion of a link

between the ability to remember the order of nonverbal sounds and normal language development. This relation is also implied by Lincoln, Dickstein, Courchesne, Elmasian, R. & Tallal, (1992) who compared children of normal language development and with children having developmental language disorder on a modified Repetition Task (cf. Tallal, Stark, Kallman, & Mellits, 1981) entailing memory for the presentation of patterns of two tones of different frequency.

Whereas the animal sounds task and the Repetition Task may test similar abilities, the animal sounds task has an advantage to children of being intrinsically more interesting. The use of environmental sounds in audiometry for children has also been suggested by Myers, Letowski, Abouchacra, Haas and Kalb (1994).

References

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Note

The paper is based on an honours thesis of Patti C. Graham, The development of auditory sequencing ability with a focus on specific language impairment, Department of Psychology, Univ. of Prince Edward Island, Dec. 1995.