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原著

両耳性分離聴テスト用聴取テープの試作とその応用 －特に大脳言語認知機能の側性化と脳梁サイズの測定について－

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A Modification of Voice-Stimulation Tapes for Dichotic Listening Tests and its Application: Measuring Hemispheric Cognitive Lateralization of Speech and Size of the Corpus Callosum

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Abstract

Cognitive laterality of speech and melody in the cerebral hemispheres was studied in 30 right-handed normal adults (18 to 26 years of ages, 16 females and 14 males) using the Dichotic listening test (DLT). The stimulation tapes for the DLT were comprised of sets of monosyllables, numerals, and melodies. The monosyllable and numeral tapes used were versions modified with a digital recording editing apparatus. Mid-sagittal MRI images through the corpus callosum were taken of all subjects and a word fluency test (WFT) was also performed. The relationship between DLT or WFT values and regions of the corpus callosum were examined in both female and male subbjects. With monosyllables, DLT results of female subbjects indicated a left-ear (right hemispheric) predominance ($p<0.05$), while there was no significant lateral difference in males. With numerals, DLT values showed no significant lateral differences in both males and females. With melodies, DLT results indicated a left-ear (right hemispheric) predominance ($p<0.05$) in males, while there was only a tendency toward left-ear predominance in females. WFT values, however, revealed no sexual differences. Relative ampullary sizes of the corpus callosum through the mid-sagittal plane disclosed a negative correlation with the left hemispheric predominance found with monosyllable -DLT in the male subjects, but showed a positive correlation with the left predominance in females.The ampullary sizes also correlated positively with WFT values in females and with left hemispheric predominance in melody-DLT. These findings suggest sexual differences in lateral predominace with respect to hemispheric cognitive functions and the relationships between those functions and ampullary size of the corpus callosum.

要 約

右手利き正常成人30名（18～26歳，女16名・男14名）について，両耳性聴取テスト（Dichotic listening test，以下DLT）により大脳両半球における言語・音楽（メロディー）認知の側性化を検討した．DLT用刺激テープはそれぞれ単音節，数字とメロディーの各セットからなり，前二者はディジタル録音編集機を利用して改良を試みた．全被験者は脳梁の正中矢状断MRI撮影と言語流暢性テスト（Word fluency test，以下WFT）を受けた．DLT，WFT成績と脳梁各部サイズの相関も検討した． 単音節DLTでは，女性被験者は左耳（右半球）優位性を示したが（$p<0.05$），男性被験者は有意の左右差がなかった．数字DLTでは，男女被験者とも有意の左右差がなかった．メロディーDLTでは，男性被験者が左耳（右半球）優位性を示したが（$p<0.05$），女性被験者では左耳優位性傾向のみを呈した．しかしWFT成績は性差を示さなかった． 脳梁正中矢状断面での膨大部相対的サイズは，男性被験者では単音節DLTによる左半球優位性と負の相関を示したが，女性被験者では同優位性と正の相関を示した．また膨大部サイズは，女性被験者のみでWFT成績およびメロディー認知の左半球優位性と正の相関を呈した． これらより，大脳半球認知機能の左右優位性には性差があり，またそれら優位性と脳梁膨大部サイズとの相関にも性差があることが示唆された．