

CBS Research Seminar

Lexical tone processing in Cantonese speakers with congenital amusia

Presented by

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ABSTRACT

Congenital amusia is a neurogenetic disorder primarily influencing musical pitch processing. Whether the pitch impairment extends to the language domain remains debated. Earlier studies suggest that pitch impairment in amusics is limited to the music domain. However, recent studies with more refined design suggest that the pitch deficit does extend to intonation processing in speakers of non-tonal languages. Tone language provides a unique opportunity to shed additional light on this debate, for the reason that pitch is systematically used to distinguish lexical meanings in tonal languages. To this end, I examined the performance of Cantonese-speaking congenital amusics in lexical tone processing in a series of behavioral studies and an fMRI study. The results show that Cantonese-speaking amusics exhibited inferior performance in lexical tone perception compared to musically intact control participants, which supports the notion that congenital amusia is a domain-general deficit that affects pitch processing in music and speech alike. Furthermore, there is some evidence that in tonal language speakers, the deficit is not confined to auditory pitch processing, but prevails to higher-level phonological processing. As for the neural activities, the amusics exhibited abnormal brain activities in a widely distributed neural network during the processing of lexical tone and musical stimuli. Importantly, their neural deficits appear to be different from those observed in non-tonal language speakers, and tend to overlap partly with the neural circuitries of lexical tone processing. This indicates the influence of tonal language experience on the brain activities in the congenital amusics.

•**Keywords:** Congenital amusia, lexical tone, music, Cantonese