Musical pitch production can be selectively impaired in tone deafness

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Singing is widespread in the general population. However, a minority (i.e., 10-15%) cannot carry a tune (Dalla Bella & Berkowska, in press; Dalla Bella, Giguère, & Peretz, 2007; Pfordresher & Brown, 2007). Poor singing is treated by self-defined "tone-deaf" or "unmusical" individuals as a hallmark of their musical deficiencies (Sloboda, Wise, & Peretz, 2005). Inaccurate singers typically sing out of tune (e.g., produce inaccurate pitch intervals), and some of them are also impaired on the time dimension (i.e., they sing out of time). This condition has been observed both in presence and in absence of deficient pitch perception (Dalla Bella et al., 2007; Dalla Bella, Giguère, & Peretz, in press) . It is still unknown whether this deficit in pitch production is specific to music or rather extends also to speech intonation. This possibility has been tested in AZ, a tone-deaf woman with mild pitch perception deficits. AZ and a group of matched controls performed three tasks. In an Interval imitation task they imitated single intervals presented within their vocal range. In a Speech production task they were asked to read sentences as statements or questions. Finally, in a Speech/music imitation task participants imitated short spoken or sung fragments (with lyrics), sharing the same pitch content. AZ exhibited difficulties in producing and imitating pitch in a musical context. This deficit concerned both absolute pitch (i.e., pitch height) and relative pitch (i.e., intervals) in the interval imitation task, and when imitating music fragments with lyrics (i.e., with larger deviation from the target pitch/interval than observed in controls). Yet, AZ's pitch production was in the range of controls when she produced and imitated sentences. This dissociation is in keeping with the hypothesis that pitch control in music and speech are supported by separate mechanisms.

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