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Masking by Harmonic Complexes in the Hearing Impaired Belgian
Waterslager Canary

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Harmonic complexes created with component starting phases selected according to scaled modifications of the Schroeder (1970) algorithm are differentially effective as maskers in humans and several species of birds. Complexes which have peakier or more modulated envelopes are always less effective maskers than complexes with relatively flat envelopes in birds, but not always in humans. In the present study, we examined masking by such harmonic complexes in a strain of canary with a hereditary hearing impairment associated with abnormalities of the ear, the Belgian Waterslager canary. Thresholds for detecting tones embedded in harmonic maskers with envelopes that vary systematically between very peaky and very flat were measured using standard operant conditioning methods and the Method of Constant Stimuli. Belgian Waterslager canaries generally showed more overall masking compared to normal-hearing canaries and other birds. In particular, Belgian Waterslagers were much more susceptible to masking by complexes with peakier envelopes than were normal-hearing birds. These findings may reflect poor frequency selectivity resulting from the cochlear damage that underlies the hearing loss in the Belgian Waterslagers.