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Pitch-based streaming of vowel sequences, speech-in-speech segregation, and frequency selectivity

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Simultaneous and sequential segregation are described as the base mechanisms for auditory scene analysis and are likely to be involved in concurrent speech segregation. However, speech-in-noise perception has been found to be uncorrelated to simultaneous segregation, but related to pure-tone fusion threshold. This study aimed to clarify the relationship between pitch-based speech-in-speech segregation, pitch-based streaming and frequency selectivity. Twenty-five listeners with close to normal hearing were involved. Auditory filter widths were derived from a notched-noise method. Speech-in-speech perception was measured using words presented in a time reversed single talker background, with various pitch differences between target and masker. The streaming performance was measured using an objective order-naming task on vowel sequences. The results showed a correlation between frequency selectivity and performance in speech-in-speech perception suggesting that intelligibility relies on simultaneous masking. A correlation was also found between the effect of pitch on speech-in-speech perception and the effect of pitch on streaming performance. However, no correlation was found between streaming and frequency selectivity. These latter results suggest that pitch-based segregation probably relies on pitch discrimination which is only weakly correlated to frequency selectivity.