Comments

Comment by Hartmann:

The stimulus used in these streaming experiments is more complicated than SAM noise with alternating modulation rates. It is also pulsed. Can you describe the dependence of the streaming effect on modulation rate and pulse timing and possible interactions between these parameters?

Reply:

The dependence of the streaming effect on modulation rate. The present experiments were designed to test the influence of modulation rate differences on streaming performance. It has been shown that, when using a nominal modulation rate of 100 Hz, a modulation rate difference larger than one octave between two rates, A and B, generally leads to the segregation of an ABA- sequence into two streams. However, a single 100-Hz nominal frequency has always been used and no data are available in the literature using a different nominal modulation rate. The dependence of the streaming effect on modulation rate *per se* has then not been explored and remains an interesting and relevant question.

The dependence of the streaming effect on pulse timing. There are no data describing the dependence of the streaming effect on pulse timing in experiments involving modulated bursts of noise. This parameter is crucial in streaming experiments involving pure tones (van Noorden 1975) and might also be important with noise. We have collected some preliminary data on this question. Three young subjects with no history of hearing disorder took part. They were presented with temporal sequences of ABA triplets of sinusoidally amplitude-modulated (SAM) bursts of broadband noise. The A bursts were fully modulated at 100 Hz whilst the B bursts were modulated at 400 Hz. Four different burst durations were used: 50, 100, 150, and 200 ms. At the end of each sequence, the subject had to report whether they had managed to hear a single stream throughout the sequence or not. The number of "two streams" responses in Fig. A1 is simply the number of negative responses to this question, averaged across subjects.

The data in Fig. A1 show that pulse timing does seem to have an effect. The number of twostream responses decreased with increasing burst duration between 100 and 200 ms. Taking 50% as threshold, these data suggest a temporal coherence boundary (van Noorden 1975) between 150 and 200 ms. Interestingly, the small number of 2-stream responses in the 50-ms condition suggests a lower limit for stream segregation. The largest number of two-streams responses was observed for the 100 ms burst duration. This was the case not only in the averaged data, but also at the individual level. This apparently optimum duration was the one used in the main experiment reported our paper.

Possible interactions between modulation rate and pulse timing. One possible explanation for the small number of 2-stream responses in Fig. A1 for the 50-ms burst duration is the number of cycles of modulation per burst, which depends on both modulation rate and burst duration. The 30-ms plateau duration in the 50-ms condition leads to only three full-scale cycles for the 100-Hz modulation rate, and this may prevent optimum processing of amplitude modulation (Sheft and Yost 1990; Lee and Bacon 1997). Future studies in which the above two parameters are varied conjointly will have to be performed to determine how they interact. Additional interactions between modulation rate and pulse timing might be possible.

Lee, J, Bacon, S.P. (1997) Amplitude modulation depth discrimination of a sinusoidal carrier: Effect of stimulus duration. J. Acoust. Soc. Am. 101, 3688-3693.

Sheft, S, and Yost, W.A. (1990) Temporal integration in amplitude modulation detection. J. Acoust. Soc. Am. 88, 796-805.

van Noorden L.P.A.S. (1975) Temporal coherence in the perception of tone sequences. Unpublished doctoral dissertation, Technische Hogeschool Eindhoven, Eindhoven, The Netherlands.

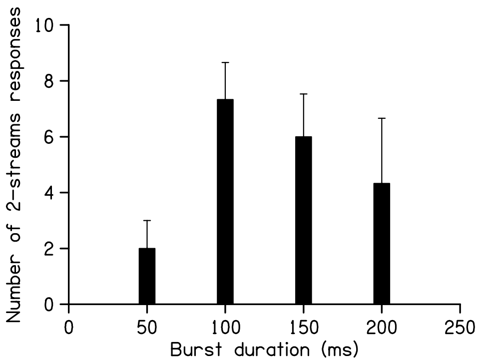

Fig A1. Average number of 2-streams responses as a function of the burst duration for a 2-octave difference between A and B modulation rates