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Lombard speech: effects of task and noise type

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An analysis of the effect of noise on speech production requires material recorded while undertaking realistic tasks in the presence of realistic noise backgrounds. This study examined speech produced in a number of types of "noise" in tasks with and without a communication factor. In one task, individual speakers were asked to speak aloud while solving "sudoku" puzzles, while in another task pairs of speakers solved these puzzles cooperatively. In both cases the background was quiet or contained one of three types of noise: competing talker, babble-modulated noise and speech-shaped noise. Individual digit words "one" to "nine" and speech/nonspeech sections were manually segmented for acoustic analysis. Both tasks produced Lombard effects observed in previous studies: increases in duration, energy, F0 and spectral centre of gravity. Relative to the non-communicative task, the presence of a communication factor led to words with shorter duration, more overall energy and higher spectral centre of gravity. Speakers actively avoided overlapping with the competing speech masker, with a stronger effect in the communicative task. These results suggest that speakers can, to some extent, compensate for both energetic and informational masking at the ears of the interlocutor.