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Temporal asymmetry in loudness

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A study by Canévet and Scharf (1990) showed that sounds that are continuously decreasing in level are perceived to decrease in loudness more than two sounds presented successively with the same difference in level. The authors explained this difference by an inherent auditory asymmetry which they called auditory 'decruitement'. Using the same kind of stimuli, Neuhoff (1998) showed that loudness change is judged greater for a continuously increasing than for a continuously decreasing sound with the same change in level. Neuhoff explained this difference by an 'ecological' point of view that human beings are more aware of increasing signals. More recently, using short- duration stimuli (<250 ms), Stecker and Hafter (2000) compared sounds with opposite attack/decay characteristics; F-S (fast-slow) and S-F (slow-fast). The results showed that S-F stimuli were louder than F-S stimuli having the same energy. The authors explained their results by a mechanism of 'decay suppression'. The present paper presents the different arguments that explain the effect of temporal asymmetry on loudness. Then, a set of loudness evaluations obtained using increasing and decreasing ramps of identical duration shows the same asymmetric phenomenon. We show, however, that it can be explained by a short memory effect called the 'recency effect'.