

Dept. for Speech, Music and Hearing
**Quarterly Progress and
Status Report**

**Stopping in running and in
music performance Part I.
Runners' decelerations and
final ritards**

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journal: TMH-QPSR
volume: 38
number: 1
year: 1997
pages: 067-073

<http://www.speech.kth.se/qpsr>



**KTH Computer Science
and Communication**

Stopping in running and in music performance

Part I. Runners' decelerations and final ritards

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Abstract

Music and motion are generally assumed to be closely related. In an attempt to analyse such relations with regard to the stopping of running and the termination of a piece of music, we made video recordings of four professional dancers while they were stopping after running. Interstep durations were determined from contact microphones on the floor and step lengths from the video recordings. Two different initial step frequencies were used at three different deceleration conditions. Instant values of body velocity and step frequency were estimated. Six choreographers rated the aesthetic quality of the deceleration from the video recordings. The data curves from highly rated decelerations seemed more regular and smooth as compared to the decelerations rated lower. In highly rated decelerations the change of step frequency could be approximated by a linear function of step number and the mean body velocity as a square root function of time. This implies a linear relationship between kinetic energy and time, i.e., the braking power remained constant throughout these decelerations. The mean body velocity showed a striking similarity with the mean tempo of final ritards in music performances.