frontiers

Supplementary Material

Table 1 | Resume of the parameters extracted and their signification

Input level: central system	
$\mathbf{t_0}$	It is the time that takes the brain to perceive the stimulus and emit the command to the musculoskeletal system. It refers to the moment when a population of neurons sends a motor command, it occurs after the audible stimulus is perceived and the motor command prepared.
$\mathbf{\Delta(t_0)}$	It reflects the rhythmicity of an input command. It represents the time elapsed between two successive t_0 and is used in the oscillations only.
D	It corresponds to the distance covered by the resulting lognormal.
$\mathbf{\theta_s}$	It is the starting angle of the lognormal.
$\mathbf{\theta_e}$	It is the ending angle of the lognormal.
Timing properties of the neuromuscular system: peripheral system	
$\mathbf{\mu}$	Also known as the logtime delay, it represents the time taken to reach half of the distance movement on a logarithmic scale. It corresponds to the rapidity of a reaction to a command by a system.
$\mathbf{\sigma}$	Also known as the logresponse time, it represents the time taken from the neuromuscular system to respond to a command on a logarithmic scale. It is also linked to the movement duration and is a measure of the asymmetry of the lognormal.
Global state of the neuromotor system	
Nblog	It is the number of lognormals required to reconstruct the velocity profile of the movement.
SNR	It is the measure of the quality of the movement reconstruction.
SNR/Nblog	It is a performance criterion and represents the motor control fluency of a gesture. The lognormality principle predicts that the ideal movement converges toward a lognormal profile. When the SNR/Nblog is higher, the movement is more similar to the ideal one, as postulated by the lognormal behavior.

Motor program execution ($\Delta(t_0)$ is used instead of t_0 for the calculus in the oscillations)	
Mode	It is the time at which the maximum value of the lognormal impulse response is reached. $$M = t_0 + e^{\mu-\sigma^2}$$
Median	It corresponds to the time at which the half value of the integral under the lognormal curve (50% of the covered distance) is reached. $$m = t_0 + e^{\mu}$$
Time delay	It represents the rapidity of a neuromuscular system to respond to a command. $$\bar{t} = t_0 + e^{\mu+0.5\sigma^2}$$
Response time	It is a measure of the spread of the impulse response. $$s = (\bar{t} - t_0)\sqrt{(e^{\sigma^2} - 1)}$$
Asymmetry	It characterizes the shape of the lognormal. $$A_c = 1 - e^{-\sigma^2}$$
Other parameters	
Reaction time	It is the time needed to start the movement after a stimulus. In the present study, it was computed as the time required to reach 10% of the maximal velocity during the test
Command propagation	It is the duration of the command propagation $$CP = RT - t_0$$