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## *Supplementary Material*

**Table 1 | Resume of the parameters extracted and their signification**

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| **Input level: central system** | |
| **$t_0$** | 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. |
| **$\Delta(t_0)$** | 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. |
| **$\theta_s$** | It is the starting angle of the lognormal. |
| **$\theta_e$** | It is the ending angle of the lognormal. |
| **Timing properties of the neuromuscular system: peripheral system** | |
| **$\mu$** | 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. |
| **$\sigma$** | 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) | |
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| **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. $$s = (\bar{t} - t_0)\sqrt{\left(e^{\sigma^2} - 1\right)}$$ |
| **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 $$CP = RT - t_0$$ |