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Measuring the Effectiveness of Response Inhibition regarding to Motor Complexity: Evidence from the Stroop Effect

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Abstract : We studied the effectiveness of response inhibition in movements with different degrees of motor complexity when they were executed in isolation and alternately. Sixteen participants performed the Stroop task which was used as a measure of response inhibition. Participants responded by lifting the index finger and reaching the screen with the same finger. Both actions were performed separately and alternately in different experimental blocks. Repeated measures ANOVAs were used to compare reaction time, movement time, kinematic errors and Movement errors across conditions (experimental block, movement, and congruency). Delta plots were constructed to perform distributional analyses of response inhibition and accuracy rate. The effectiveness of response inhibition did not show difference when the movements were performed in separated blocks. Nevertheless, it showed differences when they were performed alternately in the same experimental block, being more effective for the lifting action. This could be due to a competition of the available resources during a more complex scenario which also demands to adopt some strategy to avoid errors.

Keywords : response inhibition, motor complexity, Stroop task, delta plots
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