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The effects of age on timing of gross and fine motor movements

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I. Introduction

Timing of bodily movements may not be controlled all in the same way. It is believed that an internal clock mechanism controls discrete movements (finger tapping). Smooth continuous movements (circle drawing) are not controlled by a clock (Huys et al., 2010; Spencer et al., 2003).

Research has found this to be true for fine motor movements. However, the relationship of fine repetitive tasks to gross repetitive tasks has not been studied.

This experiment looked at the relationship of gross and fine repetitive movements in young and old age groups to see if there exists a correlation between these movements, and to discover the effect of age on these correlations.

II. Methods

Four tasks were performed: circle drawing, tapping, walking, and cycling. Each task was performed to a metronome. The metronome sounded ten times, then the participant continued the task for 20 seconds without the metronome. Ten trials were performed for each task.

The younger participants n=34 were college students ages 18-30. The older participants n=25 regularly participated in cycling, and were between the ages of 65-85.

III. Results

No correlations were seen between cycling and circle drawing. Likewise, no correlations were seen between tapping and walking.

CV % was significantly greater for the older group than the younger group for bimanual tapping (F (1,228) = 3.79, p = .05) and for walking (F (1,228) = 21.61, p < .0001).

IV. Conclusions

The correlations reveal that the same timing mechanisms that control fine motor skills may not be as easily seen in the behavior of gross motor skills.

The coefficient of variation of timing intervals revealed that, as an individual ages, both tapping and walking (movements that we believe to be controlled with an internal clock) become more variable. It was also found that timing without a clock (seen with smoothly produced tasks) may be preserved with increasing age.

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