

1,2,3-Tap



The Relation between Finger Tapping and Counting across Children and Adults

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The Relation between Fingers and Numbers

Butterworth (1999) has proposed that neural pathways for counting become linked with pathways for finger control during childhood with the development of finger counting. Evidence of this linkage has been demonstrated in children (Barnes et al. 2004, Fayol et al. 1998) and in adults (Zago et al. 2001). This implies that the relation will be present in adulthood through an association between fine motor control and counting ability that is consistent across age.

Research Questions

1. Does the relation between fine motor control and counting speed persist into adulthood?
2. Does the relation reflect something other than processing speed?

Measuring the Speed of Tapping, Counting and Processing

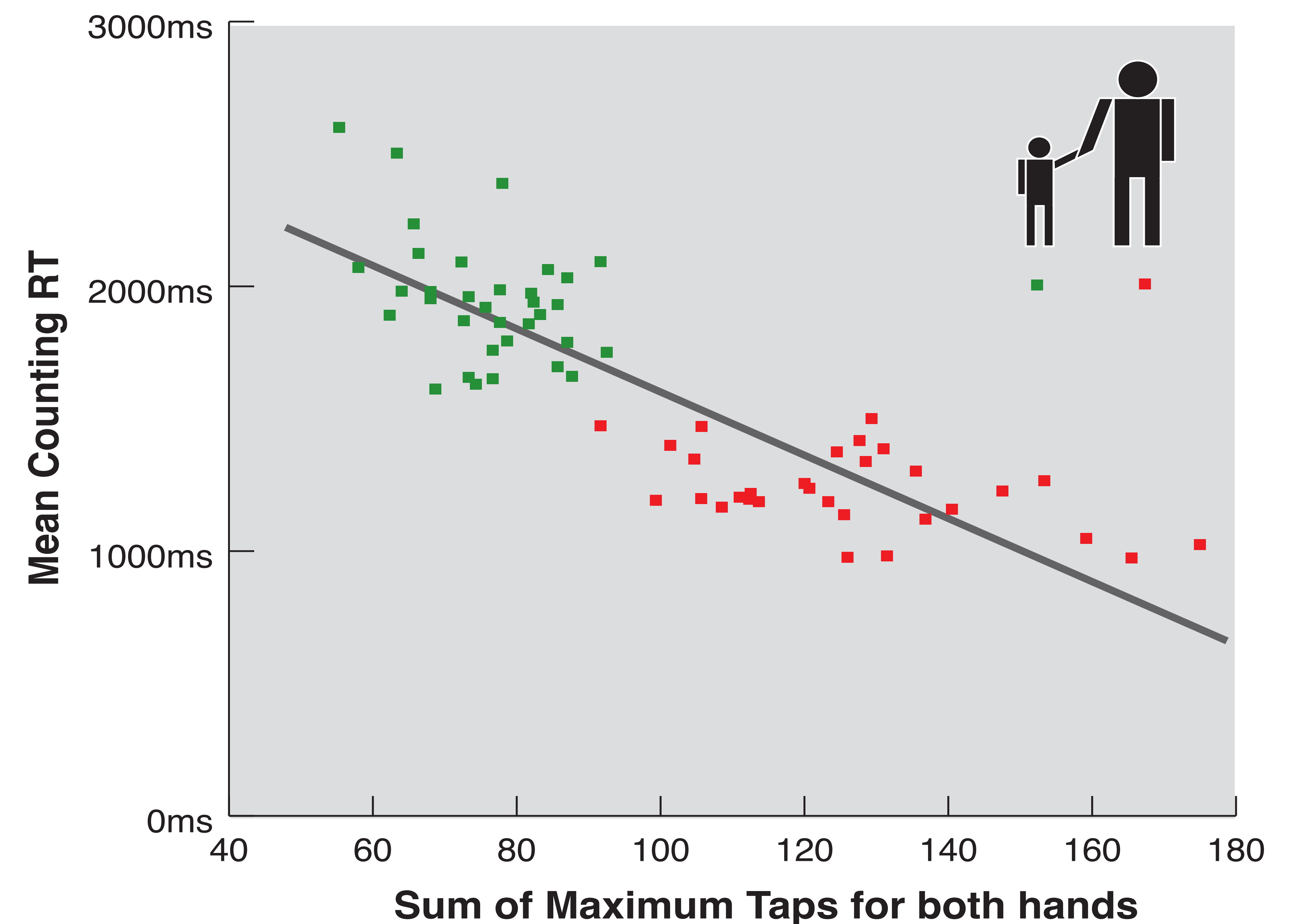
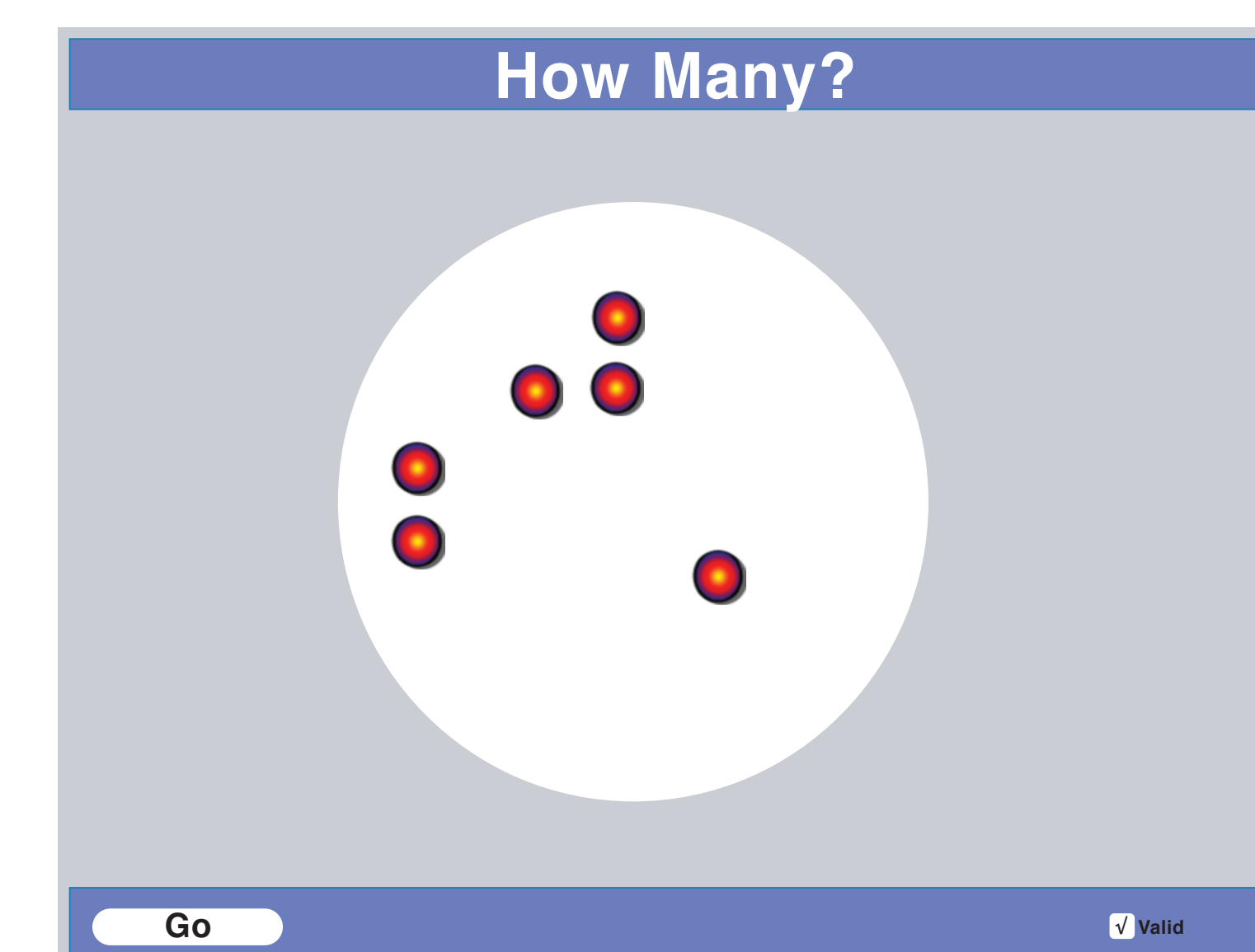
Adults (n = 30; mean age = 34.6 years) and children (n = 34; mean age = 7.1 years) performed a computerized battery of tasks. Fine motor ability was measured using a fun computerized version of Halstead's Finger Tapping Test. Participants performed three 10 second trials for each hand. Counting performance was measured using a timed "How many are there?" task with arrays of 1 - 9 objects. 28 of the children also completed a four minute 'Go-No Go' task. Response times for the correct Go trials were used as a measure of Processing speed.

Consistent Relation

As shown in the graph, we found that the adults and children show a similar significant relation between finger tapping rates and counting speed ($r = -.45$ for both groups).

For the children, the combination of both Processing Speed and Tapping predicts 28.6% of the variability in the mean Counting RT. The unique contribution of processing speed was not significant ($r = .28, p = .15$). Tapping did contribute significant unique variance to Counting speed ($r = -.39, p = .05$).

TAP, TAP, TAP! DIG, DIG, DIG!



- The relation between fine motor and counting is consistent across age groups.
- Fine motor ability is a unique predictor of counting speed independent of processing speed in children.

These results support Butterworth's hypothesis that number representations are highly associated with the neural representations of fingers and hands and that this association is consistent across development.