

What Mechanism Underlies the Rapid Automated Naming – Reading Relation?

eTale 2022



The present study examined why rapid automatised naming (RAN) is related to reading by manipulating one aspect of the RAN task at a time and by inspecting changes to the RAN-reading relation. The results of regression analyses indicated that seriality, access to phonological representations, and articulation play an important role in the RAN-reading relationship.

Authors: George Georgiou & Rauno Parrila

Source: Georgiou, G. & Parrila, R. (2020). What mechanism underlies the rapid automatized naming – reading relation? *Journal of Experimental Child Psychology*, 194, 104840. <https://doi.org/10.1016/j.jecp.2020.104840>

The present study examined why RAN is related to reading by manipulating one aspect of the RAN task at a time and by inspecting the changes to the RAN-reading relation. Accordingly, 136 Grade 2 English-speaking children and 121 university students were assessed on serial and discrete RAN, cancellation, yes/no naming, and oral and silent reading fluency. The results of regression analyses indicated that seriality, access to phonological representations, and articulation play an important role in the RAN-reading

relationship. However, their effects were not equal for the two age groups or across the two reading outcomes.

- The ability of an individual to name as fast as possible highly familiar stimuli such as letters, digits, colours, and objects (RAN) is a strong predictor of reading.
- It has been shown that RAN continues to predict word reading after controlling for several proposed mediators.
- Pause time in RAN is more strongly related to word reading than articulation time.
- Serial RAN (when all stimuli are presented simultaneously in an array) produces stronger correlations with reading than discrete naming; however, discrete naming is a stronger correlate of discrete word reading than serial RAN.
- Serial RAN dominates the prediction of reading fluency over discrete naming and only RAN tasks requiring overt articulation correlate with reading fluency.
- RAN is related to reading because it requires serial processing and overt articulation of items accessed in long-term memory.

Three different approaches to studying the RAN-reading relation:

- Examining the contribution of RAN to reading after controlling for the effects of the presumed mediator.
- Partitioning RAN total time into articulation time and pause time and examining how each component relates to reading.
- Manipulating different aspects of RAN tasks and examining how this affects the RAN-reading relation.



The study

The aim of the present study was to replicate and expand Georgiou et al.'s (2013) study with English-speaking second graders and university students.

Research questions:

- 1. Does seriality contribute to the RAN-reading relation?*
- 2. Does set size contribute to the RAN-reading relation?*
- 3. Does articulation contribute to the RAN-reading relation?*

The data was gathered from 137 Grade 2 children and 121 university students from Canada. Serial RAN, discrete naming, cancellation, yes/no naming, and reading fluency of the participants were tested. Three versions of RAN were used: a) 5 letters repeated 10 times (5×10), b) 2 letters repeated 25 times (2×25), c) 25 letters repeated twice (25×2).

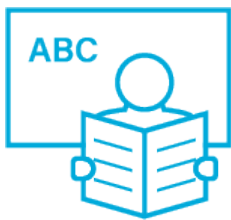


Findings

- The three serial RAN tasks correlated strongly with each other ($r = 0.54\text{--}0.73$ in Grade 2 and $r = 0.78\text{--}0.84$ in adults) and with oral reading fluency ($r = -0.45\text{--}-0.56$ in Grade 2 and $r = -0.58\text{--}-0.63$ in adults).
- In the regression analysis, where serial RAN (5×10) and discrete naming were analysed simultaneously, both naming tasks significantly predicted the reading

outcomes in Grade 2 (betas ranged from -0.230 to -0.465), but only serial RAN significantly predicted the two reading outcomes in adults (betas were -0.595 and -0.313 , respectively).

- When three types of RAN tests were analysed in the same model, both RAN (5×10) and RAN (25×2) accounted for unique variance in oral reading fluency in Grade 2; however, in adults, only RAN (25×2) predicted significantly oral reading fluency.
- When RAN (5×10), cancellation, and yes/no naming were analysed in the same model, RAN (5×10) was the only significant predictor of oral reading fluency in both groups (betas were -0.579 in Grade 2 and -0.520 in adults), and of silent reading fluency in Grade 2 (beta = -0.442).



Implications

- While both discrete naming and serial RAN predicted reading in Grade 2, only serial RAN predicted reading for adults. This implies that in early grades, children process words in reading fluency tasks one at a time (as in discrete naming). For this reason, discrete naming predicts reading. Serial naming is important irrespective of grade level because it involves processes specific to the sequential nature of the task (such as eye-movement control) and beyond the automaticity of name retrieval (tapped by discrete naming).
- This suggests that reading fluency requires both quick word recognition and efficient processing of words that

appear in sequence.

- Both RAN (5 × 10) and RAN (25 × 2) accounted for unique variance in oral reading fluency in Grade 2, which may be expected given that most words in the reading tasks would be unknown to Grade 2 children and they would need quick access to phonological representations of graphemes to facilitate decoding.
- Neither cancellation nor yes/no naming predicted reading.
- RAN and the other measures accounted for a substantially lower degree of variance in silent reading fluency than in oral reading fluency, which suggests that articulation in both RAN and reading is partly responsible for their relation.