Predicting individual differences in the perceptual span and eye movement behavior during reading
Patrick Plummer, Matthew J. Abbott, & Keith Rayner
University of California, San Diego

Background
• Previous studies using the moving window paradigm have demonstrated the size of perceptual span for skilled English readers.1,2
  ➢ 4 letters to the left & 15 letters to the right
• Measures of cognitive processing and reading skill have been shown to predict differences in the size of the perceptual span during reading.3,4,5
  ➢ e.g., reading speed, spelling ability, vocabulary size, word knowledge
• Overall reading rate is jointly determined by patterns across a number of global eye movement measures.

Current Study
To what extent are perceptual span and reading speed differences modulated by language proficiency and cognitive processing speed?

Results
Moving Window Paradigm1
After several failed attempts, vq exarpo m o o f o v o t i j aru wazewwuhdij.
* Pfizseveral failed attempts, vq exarpo m o o f o v o t i j aru wazewwuhdij.
* Pfizseveral failed attempts, vq exarpo m o o f o v o t i j aru wazewwuhdij.
* Pfizseveral failed attempts, vq exarpo m o o f o v o t i j aru wazewwuhdij.

102 total Sentences
3 Window Conditions [1W – 2W – No Window]
Window size varies randomly across trials

Measures of Individual Differences

Rapid Automated Naming
• Index of processing speed and coordination
  ➢ 4 types [Color - 3-digit number - letter - digit]
  ➢ M = 28.6 seconds (SD = 5.4 s)

Average Reading Rate
• Index of individual reading speed measured in no window condition
  ➢ M = 340 WPM (SD = 104).

Shipley Vocabulary Test
• Index of vocabulary size and language proficiency
  ➢ 40 items total
  ➢ M = 32 (SD = 2.5)

Average RAN Speed
Subjects with shorter average RAN times
• Shorter forward saccades
• Fewer regressions
• Fewer fixations
• Smaller increase in fixations

Vocabulary Scores
Subjects with higher vocab scores
• Longer forward saccades
• More frequent regressions
• Larger increases in regressions and fixations

Discussion and Future Directions
Results demonstrate individual differences in both the sources of processing difficulty and the strategic changes to global eye movement behavior
The detrimental effects of the moving window restriction were larger for more highly-skilled readers. Individual differences in balancing speed and accuracy trade-offs during reading should be more closely investigated.