

MODELING EYE-VOICE COORDINATION IN RAPID AUTOMATIZED NAMING: SMOOTH PATTERNS OF FAST PERFORMANCE

Daniel Bone¹, Chi-Chun Lee¹, Vikram Ramanarayanan¹, Shrikanth Narayanan¹, Renske S. Hoedemaker², Peter C. Gordon²
¹Signal Analysis and Interpretation Laboratory, USC ²Department of Psychology, UNC-Chapel Hill

Motivation & Introduction

Rapid Automated Naming (RAN) is a powerful tool for predicting future reading skill.

Noticeable differences in strategies of fast and slow performers.

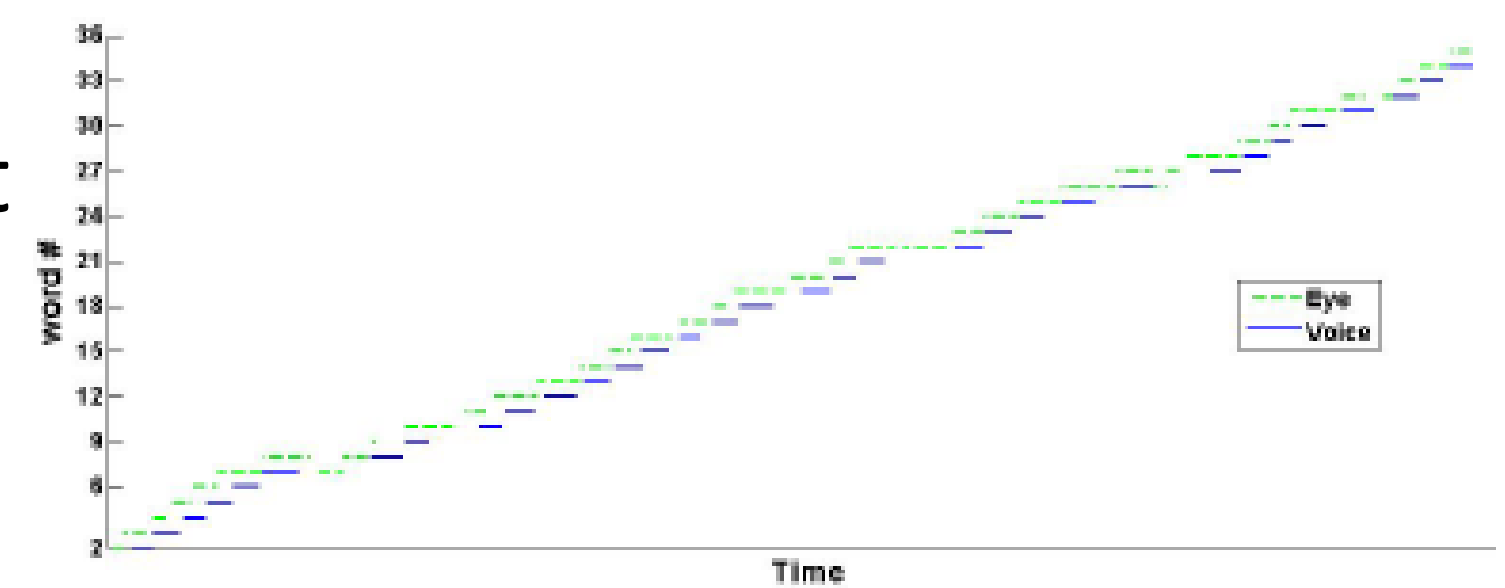
Stratification of RAN dynamics-> characterization of user technique->targeted intervention

We model dynamics of: eyes, voice, and interaction between the two

Data

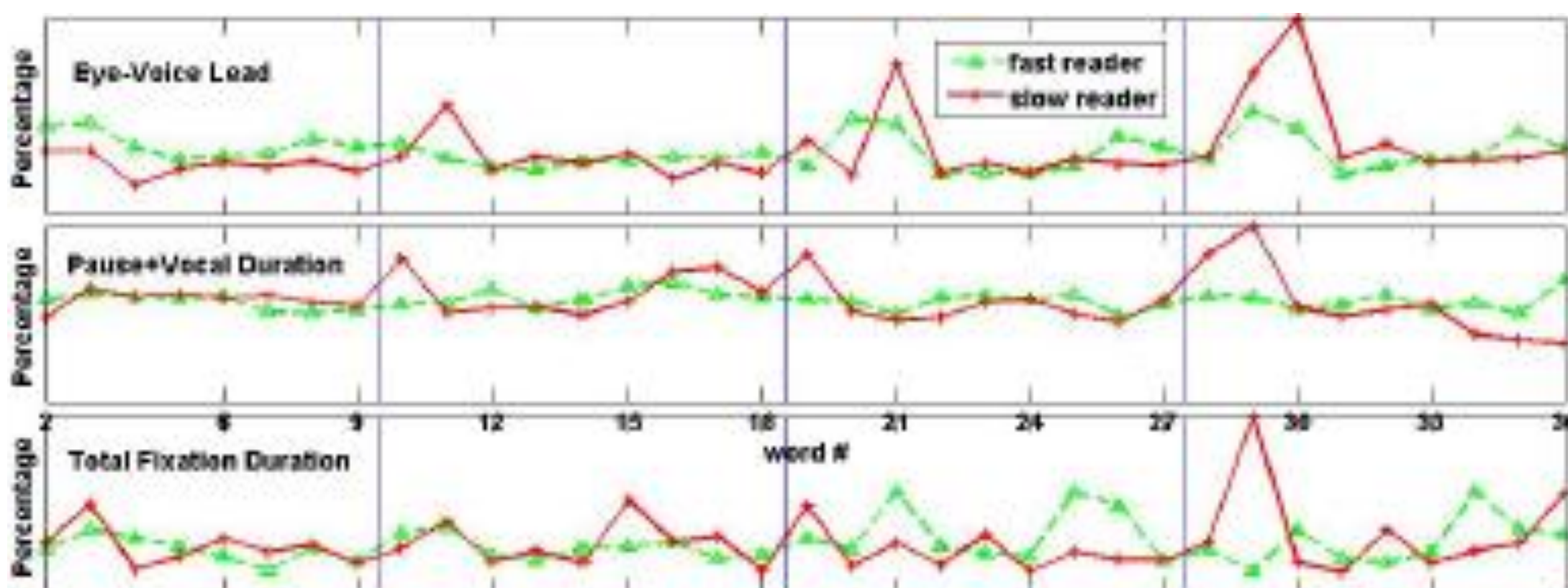
4 subtasks
Colors, Objects, Numbers, Letters
22 subjects
 2x per subtask

Top
 Colors prompt
Right
 Eye, Voice
 Traces

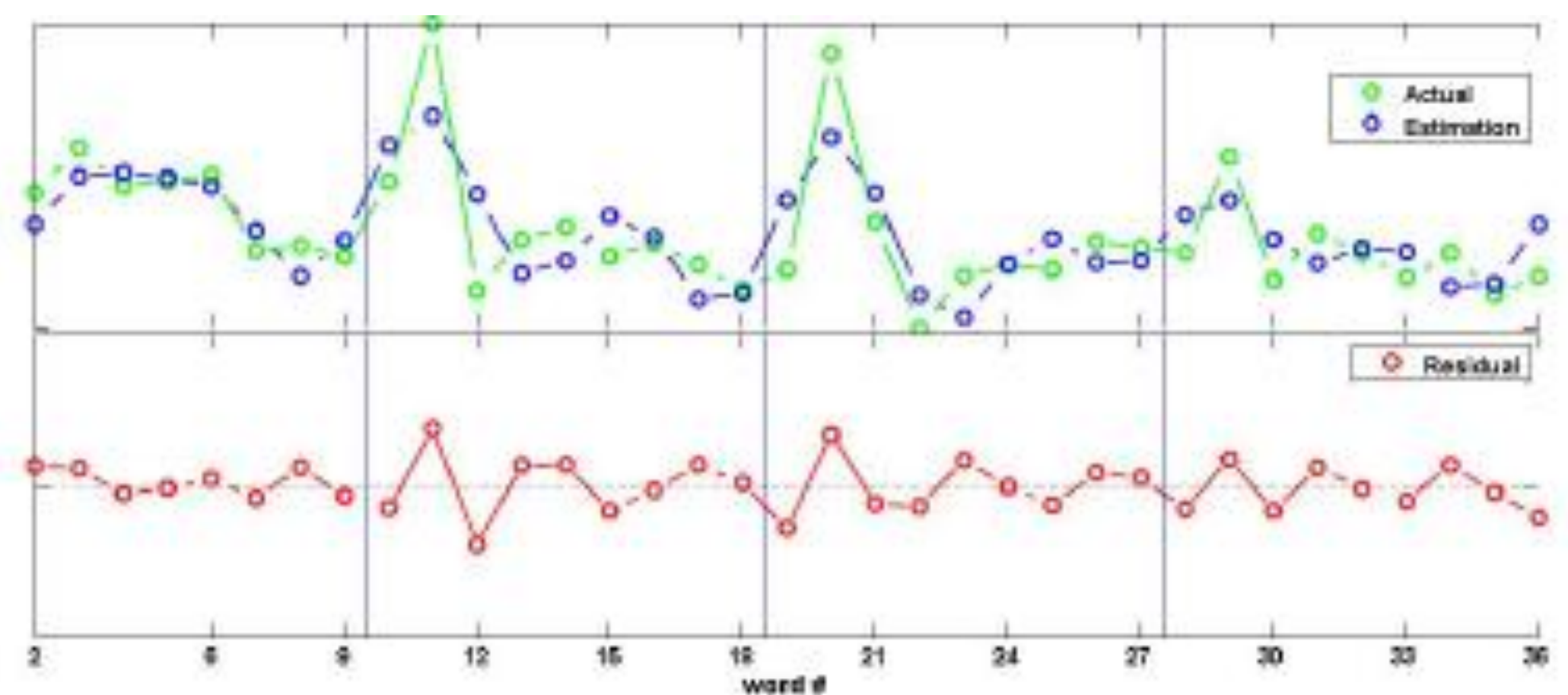


Experiments

Existence of Eye-Voice Patterns



Pattern Stability: Functional Projection Residual



Category	Object	Color	Number	Letter
<i>Modeling Each Subtask Separately- Fast Performer Exemplars</i>				
Eye-Voice	.36	.48	.27*	.14
Pause+Vocal	.42	.49	.13	.10
Fixation	.29*	0.02	.14	.11
<i>Modeling Each Subtask Separately- Slow Performer Exemplars</i>				
Eye-Voice	.13	-.17	.12	.09

Category	Object	Color	Number	Letter	All
Eye-Voice	.57	.40	.42	.30	0.42
Pause+Vocal	.47	.57	.14	.30	0.34
Fixation	.30	-.03	.23	.24	0.20

Classification Task

Category	Object	Color	Number	Letter	All
Accr.	60%	68%	65%	60%	63%

Fast versus Slow performers

Discussion & Future Work

Fast performers are similar to each other
Faster performers, smoother patterns in all signals
Faster performers look ahead further near line-end
We find meaning in the rhythm or patterns of eye-voice coordination for the speed of performance

We plan to examine the cognitive processes of children with autism using collected RAN data, now that methods to establish normal patterning have begun to be explored.