

Handwriting Characteristics and the Prediction of Illegibility in 3rd and 5th Grade Students

Gerry E Conti PhD, OTRL
Wayne State University
gconti@wayne.edu

Objectives

- How are cursive handwriting characteristics different between 3rd and 5th graders?
- Do any of these characteristics predict who is likely to have illegible handwriting?

Introduction

- Dysgraphia affects up to 30% of US children (Karlsdottir, 2002)
- Dysgraphia affects academic and personal achievement
- Study of kinematic performance components of handwriting is emerging
- Purpose: To examine components of handwriting in healthy 3rd and 5th grade students

~~Spacehips quickly orbited the moon~~
Spacehips quicrky orbited the moon.

~~Spacehips quickly orbited the moon.~~
Spacehips quickly orbited the moon.

~~Spacehips quickly orbited the moon.~~
Spacehips quickly orbited the moon.

~~Spacehips quickly orbited the moon.~~
Spacehips quickly orbited the moon.

Methods

- Two grades in a suburban elementary school
- 109 Children
 - 53 3rd graders, ages 8-9y, 28 girls and 25 boys
 - 56 5th graders, ages 10-11y, 30 girls and 26 boys

~~Spaceships quickly orbited the moon.~~

Spaceships quickly orbited the moon.

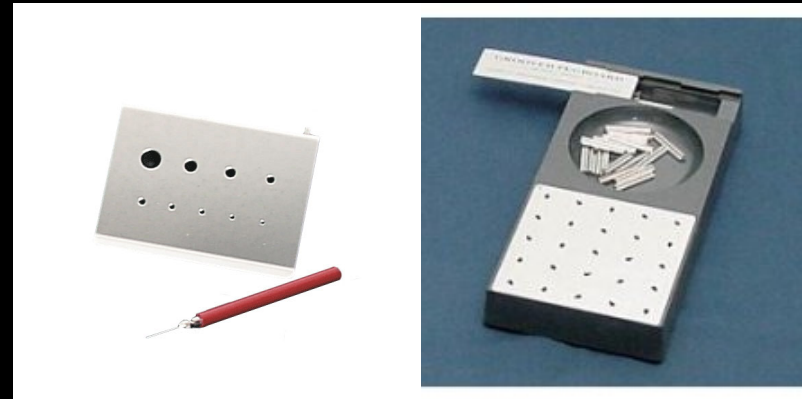
~~Spaceships quickly orbited the moon.~~
Spaceships quickly orbited the moon.

~~Spaceships quickly orbited the moon.~~
Spaceships quickly orbited the moon.

~~Spaceships quickly orbited the moon.~~
Spaceships quickly orbited the moon.

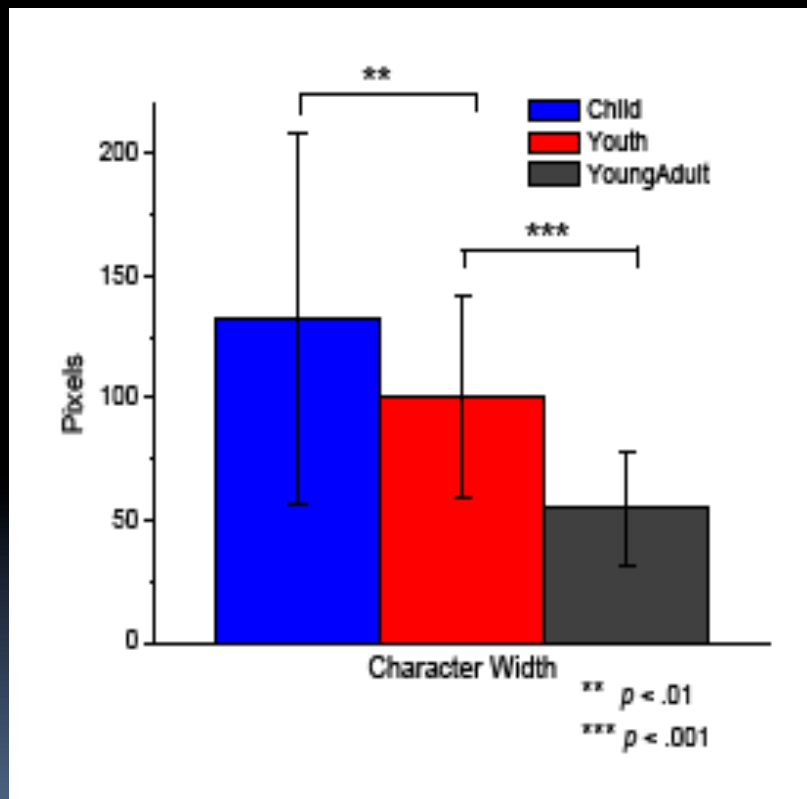
Factors Assessed

- Pinch strength
- Sensation
- Coordination
 - Hand steadiness
 - Grooved Pegboard
- Kinematic assessment of 4 linked “I”s
- ETCH

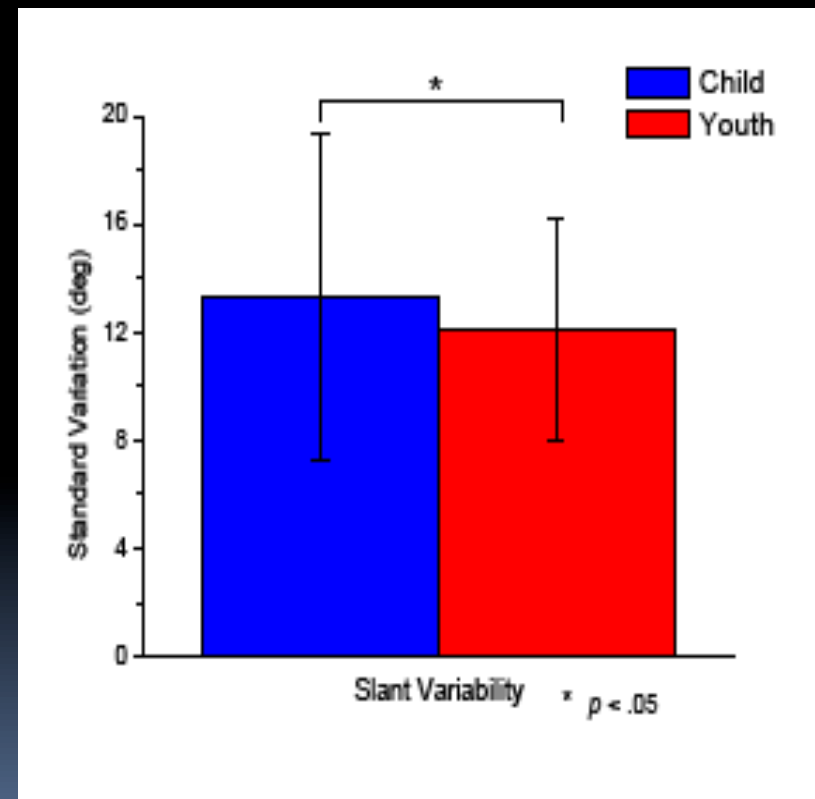


Factors of Legibility

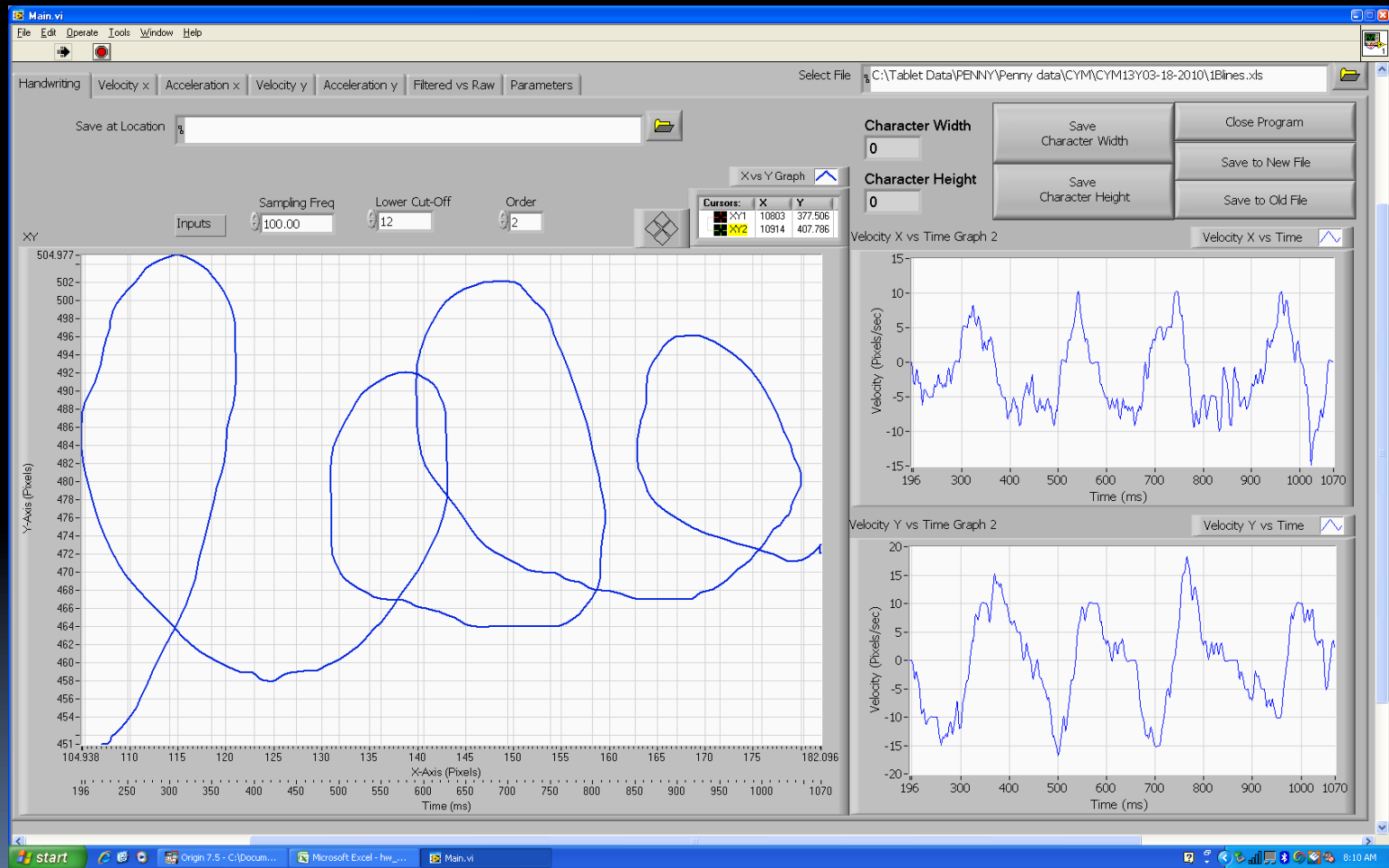
- Character Width



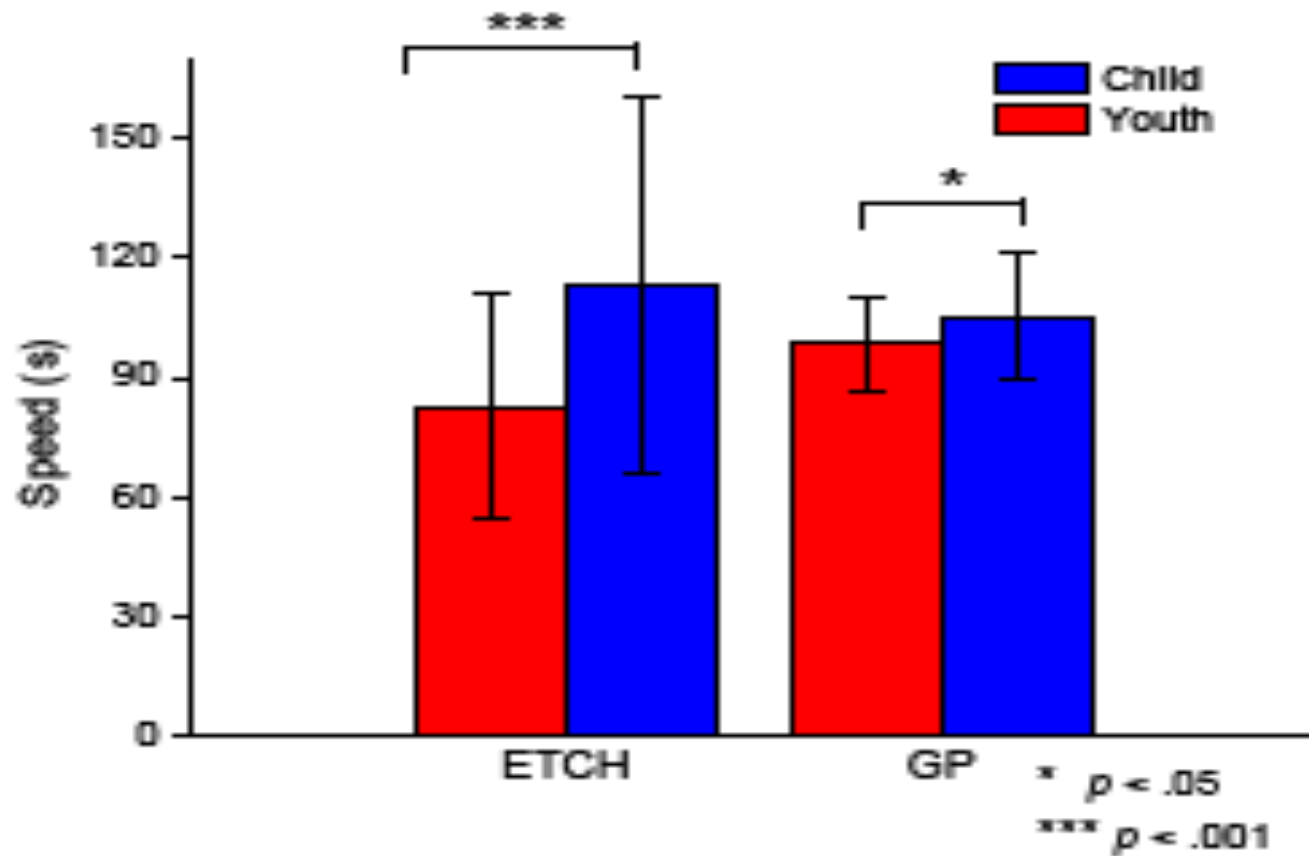
- Slant Variability



Slant and Collisions



Factors of Speed



What Predicts Poor Handwriting?

- A significant linear regression model found
 - Increased time completing the Grooved Pegboard was predictive of illegible handwriting
 - Greater errors using the Steadiness Tester was predictive of illegible handwriting
 - Being male was predictive of illegible handwriting
- Logistic regression specifically examining illegible handwriting found similar results, except being male neared significance.

Summary

- Observable, clinical, and kinematic changes occur with typical maturation between 3rd and 5th grade
- Changes include
 - Decreased character width
 - Decreased variability of slant
 - Increased speed
- The grooved pegboard and steadiness tester predict illegible handwriting.
- Being a boy may predict illegible handwriting.

Acknowledgements

- Software programming
 - Robert Erlandson
 - Sachin Vasti
 - Lovepreet Kaur
 - Ralph Conti
- Data Collection
 - Penelope Ikonomakis
- Statistical Consultation
 - Krim Lacey