CORRECTION OF PHONOLOGICAL DEFICITS IN STUDENTS WITH DYSLEXIA THROUGH THE USE OF A PHONEMIC ALPHABET, (I.T.A.)

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INITIAL TEACHING ALPHABET (I.T.A.)
**Dyslexia Facts**

**Incidence of Dyslexia**
- 2x more prevalent in English than in transparent languages (German, Italian)
- Caused by Phonological Deficit

**Phonological Awareness**
- Understanding that spoken language can be analyzed by syllables and sounds
- Examples:
  - How many syllables do you hear in ____?
  - How many sounds do you hear in______?
  - Say “meat.” Say it again, but don’t say /m/
THE PROBLEM: ENGLISH ORTHOGRAPHY

- 44 sounds but only 26 letters
- Sounds can be written >1,100 ways
- Same letter sequences = different sounds

- ough
  - rough
  - tough

- ough
  - thorough
  - furlough

- ough
  - through
  - slough
WHY I.T.A. NEEDED FOR DYSLEXIC READERS

- How normally-developing readers learn
  - Write—sed  wuz  uv
  - See—said was of

- Good readers have both an orthographic and phonetic representation of words
  - tough = tuf
  - furlough = frlœ
  - through = thrw

- Dyslexic readers missing this connection
Writing

ih liek

ie liek hoersis. ie liek two reed, twdæ ie waunt jim clas. soor is mie faevrit spoert. ie liek cats becaus thæ or sauft and flufh. ie liek maps becaus it is fun two lrn new things.

Reading

Snowmanikul

wuns upon u tem, ther wuz u snoeman naemd Snowmanikul (Snowman + ikul). Snowmanikul had a jole red nose with twu pufte butuns ies. Snowmanikul is u veare smaal snoeman. his woer u yeloe hat with butuns on it, thæ sed, ‘wundiful.’ he had twu cved arms, with twu red flufe mitens on thu ends. Snowmanikul wuz a veare jenrus snoeman.
CAN DYSLEXIA BE REMEDIATED?

Flynn & colleagues, 1989-1993

Debner & Flynn Anderson, 2017
BRAIN MAPPING STUDY: DO SUBTYPES OF DYSLEXIA EXIST?

**Dysphonetic**
- Guess from context or picture cues
- Read rapidly and inaccurately
- Substitute words that start with the same letter (boat 4 bait)
- Spelling errors are nonphonetic
  - kihin 4 kitchen
  - instot 4 institute
  - eqimen 4 equipment

**Dysorthographic (Dyseidetic)**
- Sound out the same word over and over
- Cannot recognize words on sight
- Read very slowly
- Generally have difficulty comprehending longer texts
- Spell phonetically
  - woch 4 watch
  - onerubul 4 honorable
  - fotograf 4 photograph
NEUROPHYSIOLOGICAL EVIDENCE FOR SUBTYPES OF DYSLEXIA

Differences in Brain Function During Reading

- Dyseidetic Dyslexics
- Dysphonetic Dyslexics
- Normal Readers
ACADEMIC GAINS OF I.T.A. INTERVENTION

Gains in Reading Fluency

- Curriulum-based Assessment

Spelling Gains

- WRAT-R Spelling Subtest
NORMALIZATION EFFECT OF INTERVENTION

Education Normalizes Brain Function!

- Unremediated Dysphonetics, n=23
- Remediated Dysphonetics, n=4
- Normal Readers, n=6
WHAT IS THE MECHANISM FOR NORMALIZATION?

HOW DOES I.T.A. WORK?
Slash and Dash

- Tutor dictates multisyllabic word (pusillanimous)
- Student
  - Slashes each syllable / / / / /
  - Dashes each sound in each syllable _/ _/ _/ _/ _/ _/
  - Writes i.t.a. symbol for each sound p ue / s u / l a / n u / m u s /
  - Finds word in a dictionary pu sil la ni mous

https://www.youtube.com/watch?v=Pz3xbMB0wWA&t=1s
RESEARCH DESIGN FOR
“SLASH AND DASH” STUDY

Methodology

- Single-subject design
- Sample:
  - 8 Sp. Ed. Students-4th-6th grade
- Procedure:
  - Intervention over 30 school days
  - Slash and Dash 4 words daily
  - Each week: test transfer of intervention-GFE

Instrumentation

- Pre and Post-Tests
  - Auditory Analysis Test-Revised
  - WRAT 4 Spelling Test
  - Multisyllabic 6th Grade Curriculum words
RESULTS: WIDE RANGE ACHIEVEMENT TEST

Paired-Sample T-Test

<table>
<thead>
<tr>
<th>GOOD PHONETIC EQUIVALENTS- WRAT</th>
<th>Mean</th>
<th>Std.Deviation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-WRAT</td>
<td>14</td>
<td>13</td>
<td>0.002</td>
</tr>
<tr>
<td>Post-WRAT</td>
<td>47</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

Examples:
institute-instatute
explain-explane
kitchen-kitchin OR cichin

Percent of words written as GFEs
Paired-Sample T-Test

| Multisyllabic Words List of 10 Words Scored for GFEs |
|---|---|---|
| Mean | Std.Deviation | Sig. |
| Pre-MW | 3 | 7 | |
| Post-MW | 21 | 16 | 0.006 |

Examples:
- insignificant → insegnifegent
- unstructured → unstructshured
- respiration → resperation
Results: Auditory Analysis Test

Paired-sample T-Test

<table>
<thead>
<tr>
<th>Auditory Analysis Test-Revised Standard Scores</th>
<th>Mean</th>
<th>Std.Deviation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-AATR</td>
<td>81</td>
<td>21.5</td>
<td></td>
</tr>
<tr>
<td>Post- AATR</td>
<td>103</td>
<td>7.6</td>
<td>0.02</td>
</tr>
</tbody>
</table>

"Say___" "Don't Say___" Correct Response

<table>
<thead>
<tr>
<th>turkey</th>
<th>tur</th>
<th>key</th>
</tr>
</thead>
<tbody>
<tr>
<td>create</td>
<td>/e/long</td>
<td>crate</td>
</tr>
<tr>
<td>location</td>
<td>ca</td>
<td>lotion</td>
</tr>
<tr>
<td>carpenter</td>
<td>pen</td>
<td>carter</td>
</tr>
</tbody>
</table>
CONCLUSIONS

1. Dyslexia CAN be remediated

2. Remediation normalizes brain function

"I wanted to write to you to say thank you for all the work you have done to help children learn to read. I don't know who I would be today without i.t.a.. Not only do I love to read for enjoyment, but I have been able to get a great education and help others."

~ Jessica Anderson, MSW
University of MN
RESOURCES FOR MORE INFORMATION

Additional Research of Dr. Jane Flynn (Anderson)

- http://itaprogramwinonasmu.org/

- https://www.youtube.com/user/ReadingDocFlynn