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The Multifaceted Relationship Between Second Language Acquisition, Special Education, and Neuroscience

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The Multifaceted, Complex Relationship between English as a Second Language, Special Education, L2 Reading Disability Risk Factors, and Neuroscience

By,
Carolyn A. Peterson
Graduate Student
Specialist Teacher of Reading
Research Background

This presentation combines two phases of research studied since Fall 2017 in EECLD 6002, *Essential Linguistics: What Every Teacher Should Know About Language* and continued through the Fall 2018 in *Research in Reading*.

- **Phase 1 Research:** The Multidimensional, Complex Relationship between English as a Second Language and Neuroscience (*adolescent and adult English learners*)

- **Phase 2 Research:** The Multifaceted, Complex Relationship between K-12 English as a Second Language, Special Education, L2 Reading Disability Potential Risk Factors, and Neuroscience
**Research Questions**

**Phase 1:**
What does the current body of research say about the impact of neuroscience on second language acquisition for adolescent and adult learners between 2009-2017?

**Phase 2:**

**Main Question:**
How does an elementary aged English Language Learner’s demonstrated current proficiency level and cognitive ability in L1, potentially impact the child’s classification of being at risk for a reading disability in English (L2)?

**Sub Questions:*

1. How do programs in schools guide identification of elementary and adolescent English Language Learners’ literacy needs and the possible need for special education services?

2. What role does formal and informal assessment serve in identifying an elementary or adolescent English Language Learner who has a language difference vs. language disability in English (L2)?
Key Points in the Literature: English as a Second Language and Special Education

- Language Difference vs. Learning Disability
- Over and Underrepresentation in Special Education
- Clinical Assessment
- Culturally Responsive
- Providing Support in the Least Restrictive Environment

Chu & Flores, (2011)
Fernandez & Guzman, (2014)
Huang et al., (2011)
Orosco & O'Connor, (2014)
Klingner et al., (2014)
Serpa, (2005, 2011)
Sullivan, (2011)
ESL, Spec Ed, L2 Reading Disability and Neuroscience
Key Points in the Literature: L2 Reading Disability Potential Risk Factors

- Difficulty with **Working Memory** in English
- Difficulty with **Phonological Processing** in English
- Difficulty with English **Syntax**
- Difficulty with **Spelling** in English
- **Lack of Exposure** to English

Genesee, (2016)
Swanson et al., (2012)
Swanson et al., (2017)
Zhao et al., (2016)
Key Points in the Literature

Neuroscience

Clinical Neurological Imaging

- Functional Magnetic Resonance Imaging (fMRI)
- Structural Magnetic Resonance Imaging (MRI)
- Voxel-based Morphometry (VBM)
- Electromyography (EMG)
- Electroencephalography (EEG)
- Skin Conductance (SC)

Neurological Imaging Provides Detailed Insight Into:

- Typical vs. Atypical Second Language Development
- Brain Hemispheric Involvement:
  - Vocabulary Development
  - Pitch and Tone Discrimination
  - Semantic Processing
  - Morphological Processing
  - Emotional Memory between L1 and L2 Words
  - Age of L2 Acquisition and L2 Proficiency

Archila-Suerte et al., (2015)
Baumüster et al., (2017)
Girbau-Massana et al., (2014)
Grogan et al., (2012)
Meng et al., (2016)
Piantikas et al., (2014)
Polevýnska et al. (2017)
Reiterer et al., (2009)
Yang et al., (2015)
Research Website

ESL, Spec Ed, L2 Reading Disability and Neuroscience
Strategies for Educators

Cognitive Strategies/Reciprocal Teaching
- Summarize
- Question
- Clarify
- Predict

Peer-Assisted Learning Strategies
Incorporates Peer Tutoring and Practice in:
- Phonological Awareness
- Phonics
- Fluency
- Comprehension

*Into whole class instruction*

Rivera et al., (2009)
Strategies for Educators

- Sheltered English Instruction
- Incorporation of Drama into English Language Arts Lessons
- Repeated Reading
- Explicit and Targeted Instruction
- Response to Intervention Model

Anderson & Loughlin (2014)
Choi et al. (2012)
Garcia & Tyler, (2010)
McIntyre et al., (2010)
Orosco & Klingner, (2010)
Rubin, (2016)
Strategies for Educators
Useful Websites

- Colorin Colorado  http://www.colorincolorado.org

- Multistate Association for Bilingual Education, Northeast (Dual Language Special Education Network)  
  https://www.massmabe.org/DLSEN

- MA Department of Elementary and Secondary Education
  - English Language Learners  http://www.doe.mass.edu/ell/
  - Special Education  http://www.doe.mass.edu/sped/docs.html
## Strategies for Educators

<table>
<thead>
<tr>
<th>Reading Program</th>
<th>Focus of Program</th>
<th>Group Size</th>
<th>Students’ Ages/Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read Well</strong></td>
<td><strong>Fluency</strong></td>
<td>Small Group</td>
<td>K-2</td>
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<tr>
<td></td>
<td><strong>Phonics</strong></td>
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<td><strong>Vocabulary</strong></td>
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<tr>
<td><strong>Read Naturally</strong></td>
<td>Oral Reading Fluency</td>
<td>Not Specified</td>
<td>K-12</td>
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<tr>
<td><strong>Reading Mastery</strong></td>
<td><strong>Phonics</strong></td>
<td>Small Group</td>
<td>Age 5-14</td>
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<td></td>
<td><strong>Fluency</strong></td>
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<td></td>
<td><strong>Comprehension</strong></td>
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<tr>
<td><strong>Corrective Reading</strong></td>
<td><strong>Intensive Instruction in:</strong></td>
<td>Not Specified</td>
<td>Grades 4-12</td>
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<tr>
<td></td>
<td>Decoding</td>
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<td></td>
<td>Comprehension</td>
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<td><em>(Four levels are provided in both skills)</em></td>
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<td>Students who demonstrate strong decoding</td>
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<td>skills but weak comprehension will benefit</td>
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<td>from strategies designed to support:</td>
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<tr>
<td></td>
<td><strong>Vocabulary</strong></td>
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<td><strong>Information</strong></td>
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<td><strong>Comprehension</strong></td>
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<tr>
<td><strong>Proactive Reading /</strong></td>
<td><strong>Instructional Support is Provided in:</strong></td>
<td>Small Group</td>
<td>First Grade</td>
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<td><strong>Proactiva (Spanish)</strong></td>
<td>Phonemic Awareness</td>
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<td>Orthography</td>
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<td>Word Recognition</td>
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<td>Fluency</td>
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<td>Comprehension</td>
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Rivera et al., (2009)
Phase 3 Research: In progress; I am currently completing an inquiry project for EEDUC 7105: Practicum: Interactive Assessment and Instruction. I am studying two struggling English learners in 3rd grade and 6th grade as case studies.

Inquiry Question:
How do English learners’ current proficiency levels in reading, writing, listening, and speaking in L1 potentially impact literacy learning in L2?

Sub Question:
How do age and stage impact development?


García, S. B., & Tyler, B. J. (2010). Meeting the needs of English language learners with learning disabilities in the general curriculum. *Theory Into Practice, 49*, 113-120. doi: 10.1080/00405841003626585


Massachusetts Department of Elementary and Secondary Education. (n.d.). *Special education.* Retrieved from [http://www.doe.mass.edu/sped/docs.html](http://www.doe.mass.edu/sped/docs.html)


Contact Information

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