Let's begin with words....

- Because words matter
- Because specificity matters, especially to those concerned about addressing the needs of children with disabilities
- Because, in this case, words have been used to create separation between "us" and "them", reinforcing perhaps unintended inequities that continue to be difficult to overcome.

Dyslexia & Literacy in High-Risk & Diverse Populations

- High risk ≠ diverse
- Our focus today: low socioeconomic status (SES) populations
- Risk increased by:
  - poverty (note: it is important to unpack this)
  - sequelae of poverty
  - intergenerational poverty
  - family history of language or reading difficulty
  - environmental conditions at home and school
- Diversity ≠ minority
- Our focus today: children from cultural & linguistic minority groups in the US (primarily African American)
- Includes:
  - race, ethnic, & language-minority groups
  - bilingual learners
  - bidialectal learners

Acknowledgements

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- Colleagues at the Rülin Center for Language and Literacy at The Atlanta Speech School, the United Way of Greater Atlanta, the Annie E. Casey Foundation, the Metro-Atlanta YMCA, Sheltering Arms Early Learning and Family Centers, and Atlanta Public Schools.
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  - NICHD, IES, Research on the Challenges in Acquiring Language & Literacy Initiative (GSU), and multiple nonprofit foundations in the metro Atlanta area

The opinions expressed are mine & do not represent views of the funding agencies.

Dyslexia & Literacy in High-Risk & Diverse Populations

- neurological, brain-basis
- common
- heritable
- life-long condition
- affects language processing, especially phonology
- "unexpected" difficulty learning to read
- dyslexia, reading disability, learning disability

- Word reading & spelling (e.g., phono awareness, decoding, encoding)
- Advanced reading skills (e.g., comprehension, fluency)
- Advanced writing skills (e.g., sentence and text composition)
- Oral language (e.g., semantics, syntax, morphology, pragmatics)

The Challenge:
Persistent race and SES reading achievement gaps in the US

NAEP 2013 Reading Scores

- 77% of African American & 73% of Hispanics were eligible.
If so many African American children are struggling with reading, then why are they less likely to be identified with reading disabilities and receive appropriate services?

1. **Schooling factors**
   - **Achievement gaps** are evident by age 3 and grow over time; estimated that for every year in school, gap increases by −1/10th standard deviation (Burchinal et al., 2011).
   - More likely to attend underfunded, under-resourced schools with less well-prepared teachers and lower quality instruction. These negative schooling indicators are exacerbated among children living in poverty (Deamone & Long, 2010; Peake & Haycock, 2006).

If so many African American children are struggling with reading, then why are they less likely to be identified with reading disabilities and receive appropriate services?

2. **Family & home factors**
   - Language barriers, cultural differences, and systematic racism may result in **avoidance of disability identification** (Harvey-Jumper et al., 2008; O’Hara, 2003; Zuberi et al., 2014).
   - More likely to live in families with incomes below 50% of the poverty threshold (FIFCFS, 2012; Flores & Committee on Pediatric Research, 2010). Poverty begets many negative consequences for reading achievement:
     - stress, depression, unstable housing, high mobility, low parent education levels, family history of school/academic difficulty, less access to health care and other professionals...

If so many African American children are struggling with reading, then why are they less likely to be identified with reading disabilities and receive appropriate services?

3. **Special education law & eligibility**
   - Eligibility criteria for the provision of services explicitly restricts identification for children whose learning problems are thought to be due to inadequate learning opportunities, environmental factors, cultural differences, or economic disadvantage.
   - It’s not clear if Response to Intervention processes have helped...yet.

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**Childhood poverty has been associated with differences in brain structure, especially in areas that support language, reading, and executive function** (Noble et al., 2015). So has **high quality, early, explicit reading instruction** (Shaywitz et al., 2004).

**Sound-symbol connection**

**Phonological processing**

**Word meaning**

**Letter recognition** (orthographic processing)

**After accounting for genetics and parent education levels, family income level was associated significantly with** (1) total cortical surface area, (2) cortical thickness, and (3) variation in the surface area of specific regions of the frontal, temporal, and parietal lobes. (Noble et al., 2015)

[Image: Adapted with permission from Haskins Lab Code Manual]
If so many African American children are struggling with reading, then why are they less likely to be identified with reading disabilities and receive appropriate services?

3. Special education law & eligibility
- If procedures for identification are disproportionately unresponsive to minority children, then:
  - children and families don’t have access to services to which they may be entitled
  - their undiagnosed and untreated disabilities may be contributing to the achievement gap (Basch, 2011).
- Find factors that are separable from the “usual suspects” and common among African American children.
- Focus on variation within the African American population.
- Focus on malleability: factors that are related to reading and responsive to instruction.
- Take a strengths based perspective: what do they bring to the table?
- One factor that meets these criteria: spoken dialect variation

My perspective on dialect variation...
- I use the term Nonmainstream American English (NMAE) to mean regional and cultural dialects of American English that are not typically spoken in formal settings and do not align well with standard English orthography.
- We focus primarily on African American children who speak African American English (AAE).
- NMAE features differ from “standards” or mainstream American English (MAE) in terms of the frequency and contexts in which the features are produced, not just their presence or absence. Many NMAE dialects share features that can be heard across race, SES, and sociolinguistic contexts. Therefore, I tend to consider dialect use on a continuum, and focus on the production of NMAE forms, as opposed to identifying individuals as speakers of a particular dialect or studying a specific dialect group.

My approach to addressing these issues in research
- Begin with what we know: oral language (and variation in it) matters for reading development.
- Find factors that are separable from the “usual suspects” and common among African American children.
- Look for variation within the African American population.
- Focus on malleability: factors that are related to reading and responsive to instruction.
- Take a strengths based perspective: what do they bring to the table?
- One factor that meets these criteria: spoken dialect variation

NMAE use ≠ language deficit or disorder
NMAE dialects are not impoverished versions of MAE. Rather, speakers are just using alternative rules and conventions for expressing the same syntactic relationships and semantic content.

<table>
<thead>
<tr>
<th>Phonological Features</th>
<th>Morphosyntactic Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consonant cluster reduction</td>
<td>&quot;fast&quot; for /flaʃ/</td>
</tr>
<tr>
<td>Postvocalic consonant reduction</td>
<td>&quot;plate&quot; for /plet/</td>
</tr>
<tr>
<td>Devoicing final consonants</td>
<td>&quot;salaʃ&quot; for /sæləʃ/</td>
</tr>
<tr>
<td>Substitution of /o/</td>
<td>&quot;bath&quot; or &quot;this&quot; for /θæʃ/</td>
</tr>
<tr>
<td>Zero copula or auxiliary</td>
<td>&quot;He a teacher.&quot;</td>
</tr>
<tr>
<td>Zero inflections</td>
<td>&quot;They catchin’ the bus.&quot;</td>
</tr>
<tr>
<td>Habitual be</td>
<td>&quot;He always be mad at them.&quot;</td>
</tr>
<tr>
<td>Subject verb agreement</td>
<td>&quot;He think he taller than me&quot;</td>
</tr>
</tbody>
</table>

What do we now know about young African American children’s AAE use?

<table>
<thead>
<tr>
<th>AGE/ GRADE DIFFERENCES</th>
<th>SES DIFFERENCES</th>
<th>REGIONAL DIFFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleveland 4-5 year olds</td>
<td>Low SES</td>
<td>New Orleans 4-5 year olds</td>
</tr>
</tbody>
</table>
What do we now know about the relationship between NMAE use and language and literacy skills?

- Given that young children vary widely in their NMAE use, researchers have found their performance on measures of literacy skills to vary by their spoken production of NMAE forms.
- Unlike older studies, significant associations have been reported consistently. But the nature of that relationship has varied across studies.
- Note that the focus of most of these studies has been on the production of NMAE forms, as opposed to identifying & characterizing children’s use of a specific NMAE dialect.

Oral language skills predict change in young children’s spoken dialect use

**Outcome Variable: \( \Delta\text{DVAR} \) (change in percentage of NMAE use)**

<table>
<thead>
<tr>
<th>Study</th>
<th>Grade, Age</th>
<th>Metalinguistic Skill</th>
<th>( R )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connor &amp; Craig (2006)</td>
<td>PreK, 4-5 yrs</td>
<td>Rhyming</td>
<td>-.20</td>
</tr>
<tr>
<td>Terry &amp; Scarborough (2011)</td>
<td>PreK-KDG, 4-6 yrs</td>
<td>WJ3 Sound Awareness</td>
<td>-.42</td>
</tr>
<tr>
<td>Terry (2006)</td>
<td>1st-3rd gr, 6-9 yrs</td>
<td>Modified WUG (morphosyntax)</td>
<td>-.64</td>
</tr>
<tr>
<td>Terry et al. (2010)</td>
<td>1st gr, 6-7 yrs</td>
<td>WJ3 Sound Awareness</td>
<td>-.45</td>
</tr>
<tr>
<td>Mansour &amp; Terry (2014)</td>
<td>K-2nd gr, 5-8 yrs</td>
<td>WJ3 Sound Awareness</td>
<td>-.42</td>
</tr>
<tr>
<td>Terry (in prep)</td>
<td>Fall to Spring Pre-K, 4-5 yrs</td>
<td>PALS Rhyme Awareness</td>
<td>-.31</td>
</tr>
<tr>
<td>Terry et al. (2010)</td>
<td>Fall to Spring 1st gr, 6-7 yrs</td>
<td>WJ3 Sound Awareness</td>
<td>-.33</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001

Change in young children’s spoken dialect use

**Evidence from recent studies with typically developing 4-8 year olds suggests that the lexical representations of young NMAE speakers include phonological and semantic information about MAE and NMAE. Perhaps children should be attuned to their lexical knowledge & not their speech.**

**Terry & Scarborough (2011)**

**Terry (2014)**

**Bakthari, Terry, & Mason (in review)**
Taken together, these findings bring some important trends to the forefront.

1. **NMAE/AAE production changes rapidly** among many children at the same time that they are gaining knowledge of English orthography and the oral language skills necessary to access it to read and write proficiently.

2. Young children seem to have knowledge of both MAE and AAE, which they may draw upon while learning how to read and write proficiently.

3. Children who begin formal reading instruction producing NMAE/AAE forms in speech frequently in school may be at-risk for experiencing reading failure later in school.

4. Yet, rather than conceptualizing NMAE/AAE use as a risk factor in reading achievement, perhaps malleability in children’s dialect use may be a more significant factor to consider. Reading outcomes may be improved for children who, for whatever reason, significantly increase their MAE use in school during the early elementary years.

But questions remain...

1. **Constructs**: what if it’s just language? What about links to executive function, cognitive flexibility, meta-skills?

2. **Cumulative risk & learner profiles**: what’s the tipping point at with dialect variation matters to reading achievement? For whom, under what conditions and at what developmental time points?

3. **Does research significance = educational significance**: Could we achieve positive outcomes if we were just better at teaching children to read?

Our Interdisciplinary Team

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**Project Manager:**
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**Consultants:**
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Katherine Magnuson, University of WI-Madison

Goals

Within a large cross-sequential, longitudinal sample of African American children in 1st-5th grade:

1. To examine the **contribution** of general verbal ability, dialect variation, cognitive abilities, and poverty to reading disability

2. To **distinguish** children with reading disabilities from those whose difficulty arises from other factors.

3. To explore the **causal effects** of general verbal ability and spoken dialect on essential components of reading acquisition.
Teasing apart 3 primary, interrelated constructs ain't easy!

Language → Dialect → Reading

Hypothesis 1

Hypothesis 2

Hypothesis 3

What else are we finding?

Revisiting the 4th Grade Slump

• Surprisingly, oral language skills (beyond vocabulary) have received little attention
  – Renewed interest in the ‘30 million word gap’
  – But, for this population, you must consider both systematic variation in the oral language system (dialect) and poverty’s influence on all of oral language development.

• Meanwhile, achievement gap literature suggests the gap widens the longer children are in school
  – Importantly, the slump observed in reading achievement does not indicate a loss of skills, but rather a reduction in the rate of growth that is commensurate with grade-level expectations.

But subpopulations might exist...if you look for them.

Early literacy profiles among low SES, minority children who speak NMAE

(Wadd, Torny & Mitri, 2015)

For 70% of children, spoken NMAE use did not distinguish between their profiles, but code-based skills did.

Word Reading by Phonological Awareness

X marks the spot!

Reading Comprehension by Oral Vocabulary

Reading Comprehension by Oral Morphology
What else are we finding?

Computational Modeling

- We are also using connectionist models to examine impact of dialect variation on acquiring basic word reading skills.
- Based upon well-known models previously used to study decoding, dyslexia, word meaning, and writing systems (Harm & Seidenberg, 1999, 2001; Harm, McCandliss, & Seidenberg, 2003).
- Models allow learning to be examined independent of confounds like poverty, amount of language experience, and comorbid conditions. In fact, we can explore how these factors modulate reading outcomes.

Computational Modeling applied to MAE-AAE mismatches (Brown et al., 2015)

- Previous research suggest that models take longer to learn how to read when inconsistencies from dialect differences introduced. However:
  - Effects can be reduced if context cues are included that signal which dialect to use.
  - Effects modulated by other protective, risk factors (e.g., verbal ability, language experience).
- Currently building new models.

Now back to those pesky words that matter so much…

Dyslexia & Literacy in High-Risk & Diverse Populations

- Neurologically based, language-related, “unexpected” difficulty learning to read
- Word reading & spelling difficulties (along with more advanced reading, writing, and language skills)
- Low SES populations
  - Children from race-, cultural-, & linguistic- minority groups in the US

Some tough questions that might help us connect the dots…

Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn’t really do it; they just saw something. It seemed obvious to them after a while. That’s because they were able to connect experiences they’ve had and synthesize new things. And the reason they were able to do that was that they’ve had more experiences or they have thought more about their experiences than other people.”

“ You can’t connect the dots looking backwards. So you have to trust that the dots will somehow connect in your future.”

Steve Jobs
1955-2011

Should linguistic variation be considered in discussions about dyslexia and reading disabilities?
Consider the **differential diagnosis** of a learning disability within these two student populations.

<table>
<thead>
<tr>
<th>Spelling &amp; Usage of Inflected Word Endings</th>
<th>AAE Speakers</th>
<th>Students w/LD</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Spelling: immature strategies</td>
<td>Poor and/or different ✓</td>
<td>✓</td>
</tr>
<tr>
<td>b. Usage: omissions</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>c. Inconsistent performance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>d. Persistent difficulty</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>e. Poor linguistic knowledge</td>
<td>Poor and/or different ✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Awareness and advocacy** for individuals with dyslexia and reading disabilities is ever-increasing and absolutely necessary.

- **Social justice** movement.
- **Strengths-based perspective**: creativity, out-of-the-box thinkers, precocious, imaginative, solve problems differently
- “Strengths” and “justice” for whom?

*Dyslexia & Literacy in High-Risk & Diverse Populations*

- Neurological, brain-basis
- Heritable
- Common
- Affects language processing
- Life-long condition
- "Unexpected" difficulty learning to read

Poverty changes brain structure

Intergenerational transmission of reading/academic difficulty

Brain, cultural, instruction, SES implications

4 out of 5 experience reading difficulty

Given recent advances in research on reading disabilities and dyslexia, should this defining characteristic be more nuanced?

Can one have experienced inadequate learning opportunities and less than optimal environmental conditions at home or school and family members who have had difficulty in school (and life), and be poor and belong to a race-, cultural-, or linguistic-minority group and have dyslexia or a reading disability?

**Headstrong Nation:**
*Inside the Hidden World of Dyslexia & Attention Deficit Hyperactivity Disorder*

http://headstrongnation.org/documentary

Are we looking for poor & minority children with reading disabilities and dyslexia?

Are our identification processes adequate?
Compared to higher performing schools, lower performing schools are less likely to identify students with exceptionalities. Poorer states also tend to have fewer students in special education. Perhaps they are unable (or unwilling) to provide services to such a large percentage of their students (Hibel, Farkas, & Morgan, 2010; Card & Giuliano, 2015; Zhang et al., 2014).

The newly identified gifted students were disproportionately poor, black, and Hispanic, and more likely to have parents who speak a language other than English. They were also concentrated at schools with high shares of poor and minority students and low numbers of gifted students prior to the program. (Card & Giuliano, 2015, p. 3)

“Is this a problem of access, equity, and disparity?
What can we do to bridge the divide?”

My context: Metropolitan Atlanta, GA

Where do we go from here?

- Leverage what we know to be innovative in addressing needs
- Early intervention & screening seems critical
- Appropriate evaluation, identification and eligibility processes
- Appropriate and rapid response to learning needs, especially for older students
- Sensitivity to & solutions for barriers that may be preventing equity & access
- Outreach and strategic partnerships involving parents, families, and community stakeholders

Thank you!
Visit us at:
http://urbanchildstudy.education.gsu.edu/
References available upon request