

Today's topic:

- **Language varieties and reading education, part 2**

Background:

- No reading assigned; see sources in slides for more information and background

0. Key points for today

- Review plus more details: Reading beyond phonological decoding and word recognition
- Event-related potentials (ERPs) and language processing
- J. Terry et al. (2002) ERP study: AAE-speaking 2nd graders and verbal -s in spoken math problems
- N. Terry & Scarborough (2011) on metalinguistic awareness factors

1. Sources

- Much of today's discussion is based on:

Staub (2015)

Staub, Adrian. 2015. Reading sentences: Syntactic parsing and semantic interpretation. In Alexander Pollatsek and Rebecca Treiman (eds.), *The Oxford Handbook of Reading*, 202–216. Oxford: Oxford University Press.

J.M. Terry et al. (2022)

Terry, J. Michael, Erik R. Thomas, Sandra C. Jackson, and Masako Hirotsu. 2022. African American English speaking 2nd graders, verbal –s, and educational achievement: Event related potential and math study findings. *PLOS ONE* 17 (10): e0273926.

[\[link through UNC Libraries\]](#)

1. Sources

N. Terry & Scarborough (2011)

Terry, Nicole Patton, and Hollis S. Scarborough. 2011. The Phonological Hypothesis as a valuable framework for studying the relation of dialect variation to early reading skills. In Susan A. Brady, David Braze, and Carol A. Fowler (eds.), *Explaining individual differences in reading: Theory and evidence*, 97–120. New York: Psychology.

[\[link through UNC Libraries\]](#)

Labov & Baker (2015)

Labov, William, & Bettina Baker. 2015. African American Vernacular English and reading. In Jennifer Bloomquist, Lisa J. Green, and Sonja L. Lanehart (eds.), *The Oxford Handbook of African American Language*, 617–636. Oxford: Oxford University Press.

[\[link through UNC Libraries\]](#)

2. Reading beyond word recognition

- The “**simple view**” of reading

R = **D** × **C** | **Reading** is the product of
(written-symbol) **decoding** and
(spoken-language) **comprehension**

- **Decoding:** From phonics to orthographic learning
- **Comprehension:** Includes **vocabulary** knowledge, syntactic **parsing**, semantic **interpretation**

Gough, Philip B., and William E. Tunmer. 1986. Decoding, reading, and reading disability. *Remedial and Special Education* 7 (1): 6–10. [[link](#)]

Hoover, Wesley A., and Philip B. Gough. 1990. The simple view of reading. *Reading and Writing* 2 (2): 127–160. [[link](#)]

2. Reading beyond word recognition

(this discussion is based on Staub 2015)

- **Syntactic parsing**
 - Determining the syntactic structure of a sentence
 - Fitting each word into that structure
- **Semantic interpretation**
 - Combining the meanings of words and phrases to construct a meaning for the sentence
 - Determining what the various expressions in the sentence refer to in the world
- Both processes are *usually* **automatic**/unconscious

2. Reading beyond word recognition

Some methods for studying these processes:

- **Identify** sentence structures or meanings that are **hard** to process or interpret — what “breaks”?

The horse raced past the barn fell.

The doctor that the nurse that the administrator knows hates resigned.

2. Reading beyond word recognition

Some methods for studying these processes:

- **Identify** sentence structures or meanings that are **hard** to process or interpret — what “breaks”?

*The horse **raced** past the barn fell.*

The toy bought on the internet broke.

- **Syntactic parsing error**

- Ambiguity of a word leads your parser to build the “wrong” sentence structure
- Later words you hear/read don’t fit

2. Reading beyond word recognition

Some methods for studying these processes:

- **Identify** sentence structures or meanings that are **hard** to process or interpret — what “breaks”?

*The doctor that **the nurse** that **the administrator** knows **hates** resigned.*

*The doctor that **everyone** that **I know** hates resigned.*

- **Semantic interpretation problem**

- Too hard to keep track of so many similarly constructed phrases and who they refer to?

2. Reading beyond word recognition

Some methods for studying these processes:

- **Eye tracking** — find **subtle** effects, see **time course**
 - Evidence for **syntactic parsing** problems
 - What happens when you read these sentences?
 - 1 *Since Jay always jogs a mile seems like a short distance to him.*
 - 2 *Since Jay always jogs a mile this seems like a short distance to him.*

2. Reading beyond word recognition

Some methods for studying these processes:

- **Eye tracking** — find subtle effects, see time course
 - Evidence for **syntactic parsing** problems
 - 1 *Since Jane always jogs a mile **seems** like a short distance to her.*
 - 2 *Since Jane always jogs a mile this **seems** like a short distance to her.*
 - When reader encounters *seems*, sentence 1 has
 - longer fixation duration
 - more regressions (leftward saccades)

2. Reading beyond word recognition

Some methods for studying these processes:

- **Eye tracking** — find subtle effects, see time course
 - Evidence for effects of **semantic interpretation**
 - What happens when you read these sentences?
 - 1 *Max used a knife to chop the large carrots for dinner.*
 - 2 *Max used a pump to inflate the large carrots for dinner.*

2. Reading beyond word recognition

Some methods for studying these processes:

- **Eye tracking** — find subtle effects, see time course
 - Evidence for effects of **semantic interpretation**
 - 1 *Max used a knife to chop the large **carrots** for dinner.*
 - 2 *Max used a pump to inflate the large **carrots** for dinner.*
 - Sentence 2: evidence of more processing difficulty on *carrots*
 - Very early, sometimes even on first fixation
 - More semantic anomaly = earlier effects
 - Semantic integration starts right away!

2. Reading beyond word recognition

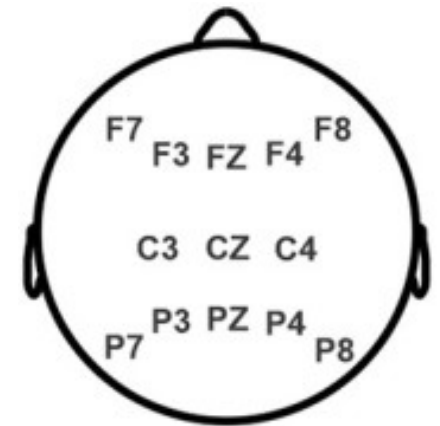
Some methods for studying these processes:

- **Event-related potentials (ERPs)** — find **subtler** effects, see time course, see **brain areas** involved

3. ERP studies of sentence processing

(this discussion is based on Staub 2015, J. Terry et al. 2022)

- Event-related potential (**ERP**)
 - Electrical activity at specific location on scalp
 - Used as a **measure of brain activity**
 - **Where** in the brain is the electrical activity?
 - Is the electrical charge **negative (N)** or **positive (P)** compared to the baseline?



(J. Terry et al. 2022: 15)

- Warning: By convention, **negative** values are usually plotted in the **upward** direction in ERP studies

3. ERP studies of sentence processing

Some ERP effects relevant to language processing

- **ELAN** (Early Left Anterior Negativity)
 - Some researchers argue that this effect is seen when **local structure building** is disrupted
 - Example: word-level syntactic category errors (wrong part of speech appears)
 - Occurs approximately **120–200 ms** after the problem word begins

3. ERP studies of sentence processing

Some ERP effects relevant to language processing

- **LAN** (Left Anterior Negativity)
 - Seen with **word-internal** errors
 - Example: error in **tense, number** or **gender**
 - Occurs approximately **300–500 ms** after the problem morpheme begins

3. ERP studies of sentence processing

Some ERP effects relevant to language processing

- **N400** (negativity at 400 ms)
 - Seen with a **semantic mismatch** between a word and its context
 - Occurs about **400 ms** after problem word
- **P600** (a late central-posterior positivity)
 - Thought to come from **reanalysis** or **repair** of **structures** that were originally mis-constructed

4. J. Terry et al. (2022): Verbal -s and AAE

From last class:

- **Why** are there achievement gaps in reading for speakers of NMAE varieties?
 - Complex question without clear answer(s)
- **Social factors:** History of discrimination leading to large differences in average socioeconomic status
 - Health, nutrition, safety
 - Home environment and resources for learning
 - Schools: teacher ratio, books, equipment, ...
- **Linguistic factors:** Children from NMAE-speaking environments learning to read a **different variety**

4. J. Terry et al. (2022): Verbal -s and AAE

- Some categories of **verb morphology** in AAE are different from MAE
 - Last time, we saw examples of *habitual BE*
 - Another difference: the 3rd person singular (3sg) present-tense verb form
 - AAE: *Mary drink coffee.*
 - MAE: *Mary drinks coffee.*
- There is a suffix **-s** in MAE that is not in AAE

4. J. Terry et al. (2022): Verbal -s and AAE

- What happens when an AAE speaker encounters this -s suffix in a sentence from MAE?
 - Some notes:
 - Many speakers of AAE also speak MAE and switch between varieties (code-switching)
 - Anyone can learn about characteristics of varieties they don't usually speak
 - BUT: Is there a potential here for an effect in educational contexts?

4. J. Terry et al. (2022): Verbal -s and AAE

- Neurophysiological effects (ERPs):
 - Predictions, p 5
 - Results, p 15
- What effects were found? How do the authors interpret them?
- Note that these effects were found in spoken language — do we predict that they should be relevant for reading also?

5. Varieties: Implications for reading education

Broad categories of research into reading and AAE (summarized by Labov & Baker 2015):

- Documentation, exploration of inverse relationship between **AAE dialect density** (proportion of AAE /non-SCE features) and reading achievement
 - Exactly why this is, is still under research and debate
 - Think about the factors we identified in our discussion above

5. Varieties: Implications for reading education

Broad categories of research into reading and AAE:

- Effect of student and teacher **attitudes toward language variety** on reading achievement
 - “Considerable research has shown that children’s nonstandard dialect has more influence on **teachers’ expectation** of their performance than their writing skills, drawing skills, or appearance...”
 - “There is no doubt that negative attitudes toward nonstandard English can **alienate** AAVE speakers from the schooling process.”

5. Varieties: Implications for reading education

Broad categories of research into reading and AAE:

- Positive effects of **metalinguistic awareness** on reading achievement for AAE-speaking students
 - This includes phonological awareness
 - Also includes awareness of differences between AAE, SCE/MAE

6. Phonological interference vs. awareness

- N. Terry & Scarborough (2011) investigate why non-MAE (NMAE) speakers who use **fewer NMAE features** score **better on reading**
- Two hypotheses (not mutually exclusive):
 - (Phonological) interference/mismatch
 - Awareness/flexibility

6. Phonological interference vs. awareness

- Two hypotheses:
 - **Interference/mismatch:** “...children who speak NMAE dialects experience greater **interference between written and spoken language** than do children whose oral dialects align more closely with printed spellings...”
(Terry & Scarborough 2011: 100)
 - For example: Decoding
A NMAE speaker might experience **more** letter-to-sound **mismatches** than a MAE speaker — Does this matter?

6. Phonological interference vs. awareness

- Two hypotheses:
 - **Awareness/flexibility:** “...children who produce many NMAE features in a context that presupposes MAE ... appear not to appreciate that a less colloquial register would be more appropriate, and thus may be demonstrating **weak metalinguistic awareness** [in general]...” (Terry & Scarborough 2011: 101)
 - What kinds of (meta)linguistic awareness have we seen to play an important role in early reading development?

6. Phonological interference vs. awareness

- Both hypotheses are relevant beyond AAE
 - “can reasonably be applied ... to children who speak other NAE dialects that ... are phonologically distinct from MAE, are associated with low social status, and are **not represented well by standard English orthography...**”
 - “...the relation between **NMAE usage** and literacy skills was similar for African American and White children who spoke AAE and Southern American English”

(Terry & Scarborough 2011: 100)

6. Phonological interference vs. awareness

- Measurable research questions?
 - MRQ (1) — p 102/middle
 - Remember direct vs. indirect effects?
 - MRQ (2) — p 103/bottom
- Results for MRQ (1)?
 - pp 109/bottom → 110/top

6. Phonological interference vs. awareness

- Terry & Scarborough (2011: 112)

“In summary, our findings suggest that using NMAE [in formal/educational settings] does not, in itself, place a child at risk for difficulty in learning to read.

“Rather, it may be an indication that a child has not developed the **metalinguistic insights** that underlie contextually appropriate flexibility of language usage and an appreciation of the phonological structure of words.

6. Phonological interference vs. awareness

“We would also speculate that linguistic awareness would enable a bidialectal child to overcome confusion, if any is experienced, about which stored phonological representations are most closely mapped onto printed spellings.

“Nevertheless, the **weak linguistic awareness** signaled by inappropriate NMAE usage may be a source of difficulty in early reading acquisition. **Fortunately, it is a risk factor than can readily be addressed through appropriate instruction.**”

(emphasis added)

7. Summing up

- **Many factors** likely contribute to the **achievement gap** between speakers of MAE and speakers of AAE
 - Likewise for other non-mainstream varieties
- Some of the factors are **linguistic**
- The effects of many linguistic factors can likely be **mitigated** through **explicit instruction**
 - of verbal -s and what it means
 - of phonological differences relevant to decoding
 - of metalinguistic awareness