An Overview of Evidence-Based Writing Assessment and Intervention

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Objectives

- Learn about the foundations of writing
- Learn about standardized and curriculum-based approaches to writing assessment
- Learn about writing interventions for students in preschool through high school
- Gain hands-on experience with some of the assessment and intervention techniques described
- Apply knowledge to diverse student populations

Disclaimer

I do not work for or receive any reimbursement from test publishing companies. One reference, Troia’s (2009) *Instruction and Assessment for Struggling Writers: Evidence-Based Practices (Challenges in Language and Literacy)* was received free while I was in graduate school when I agreed to review it for an online journal. It helped to spark my interest in writing!

Why Writing?

- Least attention of the “three Rs”
- Variety and complexity is intriguing
- Writing is an important everyday life skill
- Not on What Works Clearinghouse

Some educational stats...

- 63% of 8th graders and 69% of 12th graders were below NAEP’s *proficient* level in 2007
- What is proficient?
  - Competent, solid performance
  - Standard for grade promotion
- Only 66% of ACT-tested students were ready for freshman English composition coursework
  - (75% chance of earning a C or higher)

Some business stats...

- 120 major American corporations spend $3.1 billion annually to remediate employees’ writing deficiencies
- Only 33% of new hires possessed required writing skills
- Most (>50%) companies consider writing skills when making promotional decisions

(ACT, 2011; Salahu-Din, Persky, & Miller, 2008)
(National Commission on Writing, 2004)
Development of Writing: Theories

- No major theory, like the 5 components for reading (phonemic awareness, phonics, fluency, vocabulary, comprehension)
- Social/contextual (e.g., Englert, 1992; Russell, 1997)
- Cognitive/motivational (Graham & Harris, 2013)
- No theory is evident behind CCSS (Graham et al., 2015)
- General agreement that writing is separated into the process of writing and written products
  - *This is where you assess and intervene!!*

Writing Process

- Knowledge acquisition (memory, comprehension)
- Retrieve knowledge (memory, expression)
- Plan text
- Construct text
- Edit
- Self-regulation

[Adapted from Berninger et al., in Troia, 2009]

Products and Mechanics

- Actual written product, what is on the page
  - "Graphemic realization"
- Spelling
- Vocabulary
- Grammar/syntax/semantics
- Punctuation/capitalization

[Adapted from McCloskey (n.d.): Executive Functions and Written Expression: A Neuropsychological Perspective](http://images.pearsonclinical.com/images/PDF/Workarounds/Writing_Webinar_Handouts.pdf)
Graphemic Realization: Putting Symbols on the Page

- Prerequisite skills:
  - Symbolic Understanding
  - Alphabetic Principle
  - Letters
  - Visual Discrimination
  - Fine-Motor Skills

Spelling

- Prerequisite skills
  - Graphemic realization
  - Sound-symbol correspondence
  - Knowledge of spelling conventions and patterns, including regularly and irregularly spelled words
  - Reading skills, reading intervention!

Spelling: Three Stages of Development

- Phonological Stage (early primary):
  - Map spoken phonemes, onset-rime units, and whole words onto written letters, onset-rime units, and whole words
  - Map phonemes onto spelling units, linking phonological units to morphological units
- Orthographic Stage (late primary):
  - Automatic spelling of specific words and linking the word to its pronunciation and morphology
- Morphological Stage (middle school/early secondary):
  - Transform words from simple forms to complex words (e.g., nation to nationality)

Vocabulary

- Prerequisite skills
  - Linguistic comprehension
  - Long-term and short-term memory

Grammar/syntax/semantics

- Grammar: rules for constructing clauses/phrases/words, including syntax and semantics
- Syntax: rules/principles and processes used to construct sentences
- Semantics: meaning, word order

Punctuation and Capitalization

- Prerequisite skills
  - Memory for rules
  - Ability to apply rules
Developmental Stages?
- Can find a lot of charts and descriptions online, like this one, but they don’t link to the research base!
- Relate to developmental stages in reading
- Come from various English Language Arts curricula
- No link to grade/age?
- Reading Rockets

Written Expression Disorders & Comorbidities
- Dysgraphia
- Dyslexia
- Oral and Written Language Learning Disability
- ADHD
  - Boys: 64.5% vs. 16.5%
  - Girls: 57.0% vs. 9.4%
- Specific Learning Disability

Evidence-Based Writing Assessments

Types of Assessments
- CBM
- Rubrics
- Portfolios
- Norm-referenced assessments

Curriculum-Based Measures (CBMs)
- Assess writing products/quality
- Quick, easy administration (group or individual)
- Brief OR detailed assessment
- Assess fluency, accuracy, and production
- Excellent for progress-monitoring and goal setting
- Useful at all tiers of support
- Local and national norms
- Production-dependent and production independent measures (Jewell & Malecki, 2005)

CBM Administration
- Give a story starter (from a list or can use curricular material to make up sentence starters from grade-level books)
- Can have story starter already written down for the student or not
- Give one minute to think about the prompt
- Give three minutes to write
- Told to begin and then stop after time has elapsed
- Other prompting based on administration guides (e.g., AIMSweb)
Traditional Writing CBMs

- Total Words Written (TWW)
  - A reliable and valid measure of writing for elementary students; progress-monitors and predicts performance on end of year assessments
- Correct Writing Sequences (CWS)
  - More reliable and valid for grade 6 and above due to time utilized for planning, editing, etc.
- Words Spelled Correctly (WSC)
  - \%WSC
  - \%CWS
  (Deno, 1985; Deno et al., 1982; Marion et al., 1983; Shinn, 1989; Tindal & Parker, 1989; Videen et al., 1982)

CWS (generalized scoring guide from the literature)

- One caret is placed at the beginning of a sentence if the first word is spelled correctly, capitalized, and preceded by an indent (for the first word in a paragraph) or an ending punctuation mark and a space (for all other sentences)
- Likewise, a caret is put after the last word in a sentence (and before the ending punctuation mark) if the word is spelled correctly and is followed by grammatically correct ending punctuation.
- For the remaining words, one caret goes in between each word as long as the words are spelled and capitalized correctly, separated by spaces, and make sense in the grammatical context of the sentence. No caret is placed and the sequence is counted as incorrect if these criteria are not met.
- Some scoring standards ignore commas because of the wide range of rules surrounding commas (e.g., AIMSweb)

Practice

1. The cat was hungry. He went into the kitchen to get some milk.
2. The cat wuz hungry. He went into the ketchen to get sum milk.
3. the cat wuz hungry he went into the ketchen to get sum milk
4. the cat hungry went into ketchen get milk

Promising Writing CBMs

- Incorrect Writing Sequences (IWS; Diercks-Gransee et al., 2009; Videen et al., 1982)
- Correct Minus Incorrect Writing Sequences (CIWS; Espin et al., 2000)
- Mean length of CWS (MLCWS; Espin et al., 1999)
- Correct Punctuation Marks (CPM; Diercks-Gransee, et al., 2009; Gansle et al., 2002)
- Number of characters per word (Espin et al., 1999)
- Number of sentences written (Espin et al., 1999)
- Spelling CBM (Fuchs et al., 1993)

Examples

Practice

- I will administer a prompt and you all will write
- Please use incorrect spelling, grammar, capitalization, etc. in your responses to make scoring more fun
- Score the responses for TWW, WSC, CWS, IWS, CIWS
- Share out results
CBM Summary

- Why use just one measure?
- Support for predictive validity of writing CBM is mixed to limited for secondary students
- Some do not reliably predict performance on norm-referenced tests like TOWL-3 (Amato & Watkins, 2011)
- 3-minute time limit troublesome at higher grade levels
- Norms may not be available at high school grades, ceiling effect for short time limits

Rubrics

- Assess writing process
- Quality-based measure
- Two types:
  - Holistic: Quick overall impression – universal screening
  - Analytic: Detailed diagnosis – targeted and intensive
- Subjective, time-consuming

Writing Portfolios

- Assess writing process and quality
- Most often Tier 1
- Common contents:
  - Work samples from various stages
  - Writing from multiple contexts
  - Real-world writing
  - Summaries/reflections
  - Student input
- Formative assessment across portfolio development
- Subjective and time-consuming BUT could be built into curriculum
- Ex: Benchmark Literacy

Norm-Referenced Assessments

- WI (Riverside; ages 2-0 through 90+)
- WIAT (Pearson; ages 4-0 through 50-11)
- KTEA (Pearson; ages 4-0 through 25-11)
- TOWL (ProEd; ages 9-0 through 17-11)
- TEWL (ProEd; ages 4-0 through 11-11)
- And more, but these are most common
Woodcock-Johnson Tests of Achievement
4th Edition
- Spelling (grades PreK+)
- Writing Samples (grades 1+)
- Sentence Writing Fluency (no grade level specified)
- Editing (no grade level specified)

Wechsler Individual Achievement Test, 3rd Edition
- Alphabet Writing Fluency (grades PreK-3)
- Sentence Combining (grades 1+)
- Sentence Building (grades 1+)
- Essay Composition (grades 3+)
- Spelling (K+)

Kaufman Test of Educational Achievement, 3rd Edition
- Written Expression (PreK+)
- Spelling (K+)
- Writing Fluency (2+)

Test of Written Language – 4th Edition
Subtests
- Vocabulary
- Spelling
- Punctuation
- Logical Sentences
- Sentence Combining
- Contextual Conventions
- Story Composition
Composites
- Overall Writing
- Contrived Writing
- Spontaneous Writing

Test of Early Written Language, 3rd Edition
- Basic Writing
- Contextual Writing
- Overall Writing

How Do You Choose?
- What skill do you want to assess?
- How much detail do you need?
- In which level of intervention support is the student?
Evidence-Based Writing Interventions

Types of Interventions

- Improving writing quality versus writing quantity
- Graham and Perin’s (2007) meta-analysis separated interventions into 4 general categories:
  - Process Writing Approach
  - Direct Instruction
  - Scaffolding
  - Alternative Composition Methods
- Elementary: K-6
- Secondary: 4-12

(Graham & Perin, 2007ab; Graham et al., 2012; Rogers & Graham, 2006)

Process Writing

- Improve the writing process by:
  - Increasing opportunities
  - Writing for real audiences
  - Repeat portions of process
  - Boost peer interaction and support
  - Personalize instruction
  - E.g., writing workshop
  - Effect size across studies: $d = 0.32$ at secondary, $d = 0.40$ at elementary
  - Useful for all tiers

(Graham & Perin, 2007; Graham et al., 2012; Troia, 2009)

Process Approach

- Purpose: Create many and varied opportunities for writing
- Techniques:
  - Real audience
  - Cycle through planning, writing, and reviewing
  - Increase ownership and responsibility
  - Increase student interaction
  - Supportive writing environment
  - Self-reflection and evaluation
  - Individualized assistance and instruction
- Example: Writer’s workshop
- Outcome measures: Holistic or analytic rubric, CBM

Direct Instruction

- Explicit teaching of skills, processes, and knowledge
  - E.g., direct instruction on the connection between reading and writing
  - *Strategy instruction: $d = 0.82$ at secondary, $d = 1.02$ at elementary
  - *Summarization: $d = 0.82$ at secondary
  - *Creativity/imagery instruction: $d = 0.70$ at elementary
  - *Text structure: $d = 0.59$ at elementary
  - *Handwriting/spelling/typing instruction: $d = 0.55$ at elementary
  - *Sentence combination: $d = 0.50$ at secondary
  - *Grammar: $d = -0.32$ at secondary, $d = -0.41$ at elementary

(Graham & Perin, 2007; Graham et al., 2012; Troia, 2009)

Sentence Combining

- Teach students how to combine 2+ simple sentences into a complex sentence
- Alternative way of teaching grammar
- Useful additions:
  - Peer assistance
  - Extended practice
- Outcome measures: CBM, number or percent complete/complicated sentences

(Saddler & Graham, 2005)
Strategy Instruction

- Focus on teaching strategies for planning, editing, and revising writing
- Mnemonic devices for strategies
- Most common: Self-regulated strategy development (SRSD; $d = 1.17$ vs $0.59$ at elementary)
- Individualized—only move on when ready
- Outcome measures: Holistic or analytic rubrics, CBM

Examples:
- S — Suspend judgment
- T — Take a side
- O — Organize ideas
- P — Plan more as you write

(McGee, 2006; Graham et al., 2012; Harris & Graham, 1996)

Strategy Instruction - SRSD

6 Steps Description

1. Develop Background Knowledge
   - Introduction of strategy, purpose, discussion
2. Discuss It
   - Review purpose & strategy
   - Introduce self-regulation, mnemonic devices, graphic organizers, & goal planning sheets
   - Self-evaluate previous work
   - Set goals

3. Model It
   - Students memorize steps, practice together & with teacher until demonstrate memorization

4. Memorize It
   - Students memorize steps, practice together & with teacher until demonstrate memorization

6 Steps, cont’d Description

5. Support It
   - Independence is increased
   - Students plan, write, set goals, self-evaluate
   - Peers to teacher scaffolding to independence

6. Independent Performance
   - Independence enhanced through use in different settings and with different tasks

(Summarization)

- Purpose: How to summarize text and focus on the explicit and systematic teaching of summarization skills
- Techniques:
  - Fading of use of expert summaries
  - Teaching of summarization rules
  - Teaching of methods for synthesizing information from multiple sources
  - Focusing on main ideas
- Outcome measure: Holistic or analytic rubric, CBM

(Scaffolding Interventions)

- Offer support throughout the writing process
  - Peer assistance: $d = 0.75$ at secondary, $d = 0.89$ at elementary
  - Goal setting: $d = 0.70$ at secondary, $d = 0.67$ at elementary
  - Prewriting: $d = 0.32$ at secondary, $d = 0.54$ at elementary
  - Assessing writing: $d = 0.42$ at elementary
  - Inquiry: $d = 0.32$ at secondary
  - Model study: $d = 0.25$ at secondary
- Graphic organizers and other prompt-based scaffolding tools have also been shown to be effective

(Graham & Perin, 2007; Graham et al., 2012; Troia, 2009)
Peer Assistance

- Purpose: Students work together to plan, draft, and/or revise writing
- Students engage with each other by:
  - Assisting in choosing topics
  - Composing together on paper or computers
  - Revising and editing each other’s work
- Outcome measure: Holistic or analytic rubric, CBM

Goal Setting

The Basics:
- Student engages in timed writing task (3-7 minutes)
  - Expressive/creative/narrative AIMSweb or other curriculum-based story starters (e.g., Shapiro, 2004) or
  - Persuasive, expository essay prompts
- Score sample using countable index
- Set goal for written product based on previous performance
- Met goal 2-3 of 3 times: Increase goal
- Met goal 1 of 3 times: Maintain current goal
- Met goal 0 of 3 times: Drop to previously met goal and increase from there

Goal Setting, cont’d

- Curriculum-based outcome measures
  - CWS best for older students
  - TWW not specific enough, % measures not sensitive
  - Promising candidates: CPM, sentences, CIWS, MLCWS, characters/words
- Other countable indices:
  - Count type of sentence or paragraph
  - Count certain genre elements
- Useful additions:
  - Verbal praise and/or tangible reinforcement
  - Self-monitoring and/or self-assessment

Goal Setting, cont’d

- Students can also set goals for specific products
  - Include specific types of information in a paper (e.g., add reasons to support a statement)
  - Make specific types of revisions (e.g., add three new details)
  - Assessment method would be more rubric-like, or simply checking whether or not a specific addition was made

Practice with Goal Setting!

- Review your previous CBM
- Talk with a partner and choose where to make a goal (TWW, CWS, etc.)
- Make an ambitious but realistic goal
- PROMPT
- Score again
- Did you meet your goal?

Prewriting

- Purpose: Brainstorm ideas
- Techniques:
  - Semantic web
  - Graphic organizer
- Teach students through:
  - Model use of technique
  - Small group or peer discussion of brainstormed ideas
  - Independent use
- Outcome measure: Holistic or analytic rubric, CBM
Inquiry
- Purpose: Improve writing through teaching data analysis techniques and engaging students in activities designed to assist in idea generation
- Description, definition, argument, analysis
- Activities:
  - Collect data
  - Generate hypotheses
  - Make inferences
  - Respond to critical thinking questions
- Use information gained during inquiry to inform writing
- Outcome measure: Holistic or analytic rubric, CBM

Model Study
- Purpose: Improve student writing through study of "model" examples
- Techniques:
  - Evaluate models
  - Imitate patterns
  - Scaffold techniques with fading use of models
- Outcome measures: Holistic or analytic rubric, CBM

Alternative Composition Methods & More
- The use of technology in writing intervention
- Common tools: spell checking, transcription tools, speech synthesis, word prediction, multimedia composition, internet communication
- Also planning and revising aids that prompt, outline, or provide automated essay evaluation
- Medium effect size overall: $d = 0.55$
- Insufficient as sole instructional tool—teachers should model appropriate use and provide practice
- Word processing: $d = 0.47$ at elementary
- Comprehensive writing programs: $d = 0.42$ at elementary
- Extra writing time: $d = 0.30$ at elementary

Word Processing
- Purpose: Use of computer as instructional tool, reduce mental burden of spell-checking and editing
- Some programs have built-in prompts to remind users to engage in certain steps in writing or editing
- Outcome measure: Holistic or analytic rubric, CBM

Decision-Making
- Which skills do you want to improve?
  - Detailed assessment, good data on student, stable low levels of performance
  - How intensive are the student’s needs?
    - Slightly below or extremely below classmate achievement?
    - How many students will you be instructing?

1st grade student: What intervention would you choose? What other assessments might you administer?
- KTEA-3
  - Written Expression was administered at grade level but administration stopped and prior level administered due to student simply writing letters. SS = 57. Student happily writes.
  - Spelling SS = 63. Able to write letters and spell one sight word.
  - Letter Word Recognition: 67
  - Phonological Processing: 57
  - CBM: TWW = universal, WSC = intensive, CWS = intensive
  - WISC-5: VCI = 73, VSI = 86, FRI = 88, WMI = 85, PSI = 89, FSIQ = 78
8th grade student: What intervention would you choose? What other assessments might you administer?

- Teacher reports that student is unmotivated to write. He writes the “bare minimum” to answer the question, but on the in-class rubrics, this leads to lower scores because he needs to have certain number of details supporting his arguments. In the intensive range on holistic rubrics.
- CBM: TWW = targeted, WSC = targeted, %WSC = universal, CWS = targeted, %CWS = universal

Diverse Student Populations

- Younger learners
  - Different focus, more closely tied to reading
  - Direct instruction with practice most effective on improving reading and spelling skills

- English Learners
  - Ensure that poor writing is not due to poor language comprehension
  - Cognitive difficulty with multiple languages (BICS and CALP)
  - Qualitative > Quantitative Assessment techniques

(Duffy, 2006; Troia, 2009)

Diverse Student Populations, Continued

- Students with learning disabilities
  - Impairments in organization, processing, self-regulation
  - Strategy instruction improves both quantitative and qualitative components of writing

- Autism Spectrum Disorders
  - Impairments in organization, processing, self-regulation
  - Self-Regulated Strategy Development improves writing quality, scaffolding, self-talk, motivation, and self-perception of ability

(Gutiérrez-Buchman & Iberdiez, 2006; Delano, 2007; Graham & Harris, 1997; Graham, Harris, MacArthur, & Schwartz, 1991; Myles et al., 2003)

Diverse Student Populations, Continued

- Students with low cognitive abilities
  - Spelling, handwriting difficulties: Allow for alternative composition methods (dictation, speech-to-text)
  - Write every day! Portfolios to demonstrate growth

(Cannella-Malone, et al., 2015)

Summary of Effective Strategies

- Provide explicit, direct strategy instruction (especially SRSD!)
- Scaffold students’ writing
- Provide word processing as an option for composition
- Have students write more every day (at least 15 extra minutes)
- Utilize a comprehensive, process approach to writing instruction

(Graham & Perin, 2007ab; Graham et al., 2012; Rogers & Graham, 2006)

Future Directions

- More research on interventions in all levels, but especially universal and intensive
- Expand diversity of populations (and settings)
  - High school students, culturally and linguistically diverse students, urban and rural districts
- Increase assessment of intervention fidelity
- Continue intervention!
- Make a comprehensive measure that can be reliably scored
- Improve CBMs, especially for older students