

The Assessment of Written Syntax

by Melissa Lee Farrall

Written language, the vehicle for communication between generations and continents, has its roots in human speech and the words that children utter to their caregivers and to their teddy bears. By the time children enter school, we expect them to express their thoughts using an array of phrases, clauses, and sentences. The development of written language skill, however, is not nearly so simple or natural. Language in its written form necessitates that children control their pencils, learn the alphabet and the rules for sound-symbol correspondence, and become adept at a means of expression requiring a high degree of metalinguistic awareness and planning.

Although we may be biologically wired to speak, we are not predisposed to write. Children's first efforts to express themselves with paper and pencil pale in contrast to what they can articulate. With time, good instruction, and practice, young children learn to transcribe their letters and put words to paper. Once in middle school, students write on a level that is potentially commensurate with their oral language skill: "If I can say it, I can write it." By the time they reach high school, their skill on paper may well exceed their verbal prowess, and studies suggest that continued oral language development will depend on their experience with and mastery of written language forms (Levine & Reed, 1999).

Written language is linguistically complex, and it requires a degree of planning and organization that is not consistent with the spontaneity of speech. Because there is no possibility of conversational repair or context, writers must anticipate readers' questions and limitations. As a result, writers are forced to employ greater clarity through the use of more sophisticated vocabulary and sentences of increasing length. The increase in sentence length arises from the need to express abstract relationships and higher-level thoughts. Sentences link ideas in time and place, and express causal relationships and notions of exclusion (as in, "I like to travel but I don't like to fly"). According to Cazden (1972, p. 83), a mature style of writing reflects "the ability to pack a greater density of ideas into a single sentence by embedding one sentence into another." Scott (2004) adds that linguistic literacy presumes skill with a wide range of syntactic structures suited to different styles and purposes.

Benchmarks Past to Present

Tests that measure how well children express their thoughts on paper at the sentence level are few; researchers are still struggling to develop meaningful benchmarks for written expression. In the first half of the 20th century, academics sought to judge syntactic maturity by quantifying sentence types and lengths, subordinate clauses, and different parts of speech (McCarthy, 1954; Myklebust, 1965; O'Donnell, Griffin, & Norris, 1967). Unfortunately, not all aspects of syntax and grammar are easily or reliably measured, and the numbers did little to clarify how children learn to write.

It was 1957 when Noam Chomsky, a young scientist from MIT, published *Syntactic Structures*, a study that would revolutionize the field of linguistics. Using Chomsky's insights, linguists renewed their quest to describe how children develop their sentence writing skill. In 1965, Kellogg W. Hunt proposed a new linguistic entity called Minimal Terminable Units (T-units) based on his research with school children in grades 4, 8, and 12. T-units were defined as the shortest syntactic units that could be punctuated as sentences (Hunt, 1965; 1970). A T-unit could consist, minimally, of an independent clause; it could also consist of a "main clause plus any subordinate clauses or non-clausal structure that is attached or embedded in it" (Hunt, 1970, p. 4). The sentence "I walk" is a T-unit consisting of two words. The sentence "I walked fast and I watched the birds" consists of two independent clauses, or two T-units. If we had written, "I walked fast while I watched the birds," we would have an independent clause and a dependent clause, or one T-unit (the dependent clause cannot stand on its own). In terms of T-units, a complex sentence is actually rated lower than a compound sentence.

Hunt proposed that the average or mean length of words in T-units, known as the MLTU, could provide educators with a simple and effective indicator of syntactic maturity. Collectively, several studies (Hunt, 1965; 1970; Klecan-Aker & Hedrick, 1985; Mellon, 1967; O'Donnell, Griffin, & Norris, 1967; Potter, 1967; Richardson, Calnan, Essen, & Lambert, 1976) showed that the MLTU corresponded approximately with student age for children in the range of 8 to 15 years; students could be expected to write at an MLTU approximately equivalent to their age in years. For example, a child of 8 years could be expected to write with an MLTU of about 8 words ("I walk to the store in the morning."). An older child, 15 years of age, would be presumed to write with an MLTU of about 15 words ("I walk to the store located on the corner by the playground in the morning."). According to Scott (2009), children who write with age-appropriate length can be presumed to have an adequate repertoire of sentence types with which to meet the cognitive demands of their schoolwork and written communication needs.

Questions remained, however. Did knowing the MLTU help with diagnostic teaching? Are longer sentences necessarily better? Cazden (1972, p. 252) called the T-unit a "superficial index" of sentence maturity; after all, the number of words in a T-unit could mask a lot of syntactic sins. The MLTU was not the gold standard for writing maturity that had been hoped for (Nippold, Ward-Lonergan, & Fanning, 2005). The small increase (essentially one word per one school year) did not lend itself to measuring progress on a frequent or yearly basis (Scott, 2009; Scott & Stokes, 1995). To further complicate matters, Richardson, Calnan, Essen, and Lambert (1976) found that MLTUs varied depending on the type of writing assignment.

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Short and succinct suited some genres, while detailed and lengthy were better for others.

Those seeking alternatives to the MLTU sought to describe syntactic maturity by measuring not just numbers of words but also clause density or clause frequency (CD) (Hunt, 1965; 1970; LaBrant, 1933; Loban, 1976). CD is measured by counting the number of verb phrases in a sentence (by definition, all sentences must have a verb phrase) and dividing the number of verb phrases by the number of T-units. Children writing with simple sentences would have a ratio of 1.0, or an average of one clause per T-unit. A ratio of 2.0 would suggest that each T-unit had an average of two clauses; for example, an independent clause and a dependent clause. CD, however, suffered from similar challenges as the MLTU. Scott (1988; 2009) noted, definitional issues aside, that CD is not sensitive to yearly growth and that there is no way to account for genre and style.

While researchers seek to develop more descriptive and potentially useful methods for analyzing written syntax, evaluators have a limited repertoire of tools at their disposal. Curriculum-based measures, informal assessment, and standardized, norm-referenced tests each offer pieces of the puzzle; there is, as of this point, no approach that is able to stand as a proxy for evaluator expertise.

Curriculum-Based Measures

At present, curriculum-based measures (CBM) focus on a broader measure of writing skills that incorporates grammar, spelling, mechanics, and semantics. One such measure is known as Correct-Incorrect Word Sequences (CIWS). Breaux and Frey (2009) reported that this measure is reliable and easy to score; it effectively differentiates between good and poor writers. CIWS, however, should be considered more a global measure of sentence-level writing skill, for it does not distinguish between errors of spelling, mechanics, or grammar and syntax.

A brief explanation follows: A correct sequence is considered to be two adjacent words that are written with proper capitalization, punctuation, spelling, grammar, and meaning. Credit is given for initial capitalization and ending punctuation. A correct sequence is calculated by subtracting the number of incorrect sequences, represented by an asterisk (*), from the number of correct sequences, represented by a caret (^). The example that follows is a sentence that has been coded to identify correct and incorrect sequences:

^The^boy*goed*to^the^store^on^his^way^home*he*bot*a*botl*of^milk^.

In this example, we have 10 correct sequences and seven incorrect sequences. If we subtract the incorrect sequences (7) from the correct word sequences (10), we are left with a meager CIWS of 3. Although we might all recognize the need for concern, the CIWS does not provide any way of knowing how to focus our efforts as teachers. The use of “goed” strongly indicates the need to consult with a speech-language pathologist; the spelling errors should elicit concern from a well-trained reading specialist. So, who can help? What is the true nature

of the problem? When we use CIWS, errors in spelling, mechanics, grammar, and semantics are all reduced to indistinguishable point values. An error is just an error.

Although no one can deny the importance of statistics, they often leave us wishing for a greater understanding. Statistics and ratios do not substitute for a more detailed analysis of sentence types and clauses. Gillam and Johnston (1992) found that the ability to produce sentences with a variety of subordinate and coordinate clauses (causal, temporal, and conditional) had the potential to discriminate between children with language learning disabilities (LLD) and those without. Nippold, Ward-Lonergan, and Fanning (2005) noted that the devil is in the details and that it is necessary to consider genre and clause type. An analysis of this complexity, however, would require that teachers be better trained in grammar and syntax, skills that are often neglected in favor of what is perceived to be more important—the organizational aspects of written expression. It may be, however, that thinking of sentences as basic organizational structures would permit us to build a foundation for written expression that would (and should) precede work on paragraphs and essays.

Informal Assessment

An informal assessment has the potential to help those who wish to use writing samples as a foundation for instructional recommendations (Farrall, 2012). A list of steps follows:

1. Describe the handwriting.
2. Type the writing sample word for word (and error for error) into your word processor. Be sure to disable the autocorrect feature. This file will serve as your working draft; it will not be part of your report.
3. Describe the use of mechanics. Mechanics (capitalization and punctuation) are more than just sentence markers. They provide additional information about how to interpret words in phrases, clauses, and sentences.
4. Create a chart (see Table 1) with a column for sentences, sentence types, and additional comments or notes. It helps to focus on each sentence individually.
5. Label each sentence type (simple, compound, complex, compound-complex, run-on, or fragment).
6. Ask the following questions:
 - a. Are there different sentence types?
 - b. Are there adjectives, adverbs, or descriptive phrases?
 - c. Is there noun/verb agreement? Are there grammatical errors?
 - d. Is the language repetitive?
 - e. Are the verb tenses correct?
 - f. Describe the vocabulary.
 - g. Do the sentences make sense?
 - h. Do transition words facilitate the sequence and the flow of content?
7. Make additional notes regarding vocabulary and spelling.

TABLE 1. Sample Analysis of Written Syntax in Context

S = Simple Sentence, C = Compound Sentence, CPX = Complex Sentence, RO = Run-On Sentence, F = Fragment

Writing Sample	Type	Notes
Some astronaut went to the moon	S	Spelling error: suffix –s
They had done a lot of work.	S	
They had a lot of equitment	S	Spelling error: sound discrimination in multisyllable words
They had satlight.	S	Spelling error: sound discrimination multisyllable words, suffix –s (possible word omission)
They had space ships taking off to go back to earth.	S	
They were digging for some thing.	S	Visual sense of how words are spelled
They had rockets in a tunnel.	S	
They were all happy.	S	
They found something that looks like a magizeen	CPX	Spelling: word of French origin
That is what they were all happy about.	CPX	Tense: ending sentence with a preposition
They had done a lot of work.	S	
It is neat.	S	Tense
That is what astronuts were looking for.	CPX	Tense: ending sentence with a preposition
Mean Length of T-Unit = 6 Clause Density = 1.23 Spelling Accuracy = 94%, the rate is low given the young vocabulary.		

In the sample in Table 1, written by a student 12 years of age, we can see that this student wrote predominantly with simple sentences that lacked descriptive power and precision. The MLTU for this sample is 6, considerably less than we would hope or expect for a student of this age. The sentences—both simple and complex—lack variety in their structure. There are no transition words, adjectives, or adverbs. There are few descriptive phrases. If this were a more comprehensive analysis, we could also comment on the lack of organization and evidence of planning, the spelling errors, and the handwriting that was barely legible.

Based on this writing sample, we should request an evaluation from a speech-language pathologist of this student's oral language abilities, in particular, receptive and expressive vocabulary and syntax. Instruction should focus on providing this student with the syntactic tools (oral and written) needed for writing higher quality, more expressive sentences: how to link thoughts together through the use of coordinating and subordinating conjunctions and vocabulary. We would want to obtain additional information regarding the student's spelling and reading skill, as well as options for word processing and keyboarding. Clearly, this type of informal assessment provides more instructionally useful information. It also requires a high degree of knowledge on the part of the teacher or specialist who analyzes the writing sample.

Formal Methods of Assessment

As researchers seek to establish better ways to measure written syntax, the formal assessment of written syntax has been characterized by disagreement over the nature of mature writing and the skills that are important (Farrall, 2012). Few tests offer specific subtests of written syntax (see Table 2 for a list of tests and subtests of writing). The majority of writing tests incorporate sentence writing as part of the test; as a result, there is no one score that represents skill in syntax. Norm-referenced tests offer the following options:

- **Sentence Dictation:** Students are asked to transcribe a sentence as read aloud by the examiner. Children with challenges in syntax may have difficulty transcribing sentences with accuracy; because they do not chunk words into phrases and clauses, they may omit words and/or alter the target sentence.
- **Sentence Copying:** Young students are asked to copy a target sentence. The response may be analyzed for syntactic and mechanical accuracy: completeness, grammar, spacing between words, handwriting, capitalization, punctuation, and spelling.

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- **Sentence Formulation:** Students are asked to write a sentence based on a scenario or picture and/or they may be asked to write a sentence using a target word or words. When students are required to read the target first, the task becomes one of both reading (accuracy and vocabulary) and written syntax.
- **Fill-in-the-Blank/Sentence Completion:** Students are asked to fill in a missing word or add a beginning or ending to a sentence. The missing word is usually a verb; it is designed to measure skill with noun/verb agreement. This task may be challenging for students with weak word retrieval or with a poor grasp of word structure and grammar.
- **Sentence Combining (SC):** Students are asked to combine facts or sentences into one well-formed sentence. SC tasks provide useful information regarding the ability to write sentences that make logical connections between ideas that are dense in their content. The child who can combine the two simple sentences, “The dog barked,” and “There was an intruder in the house,” into “The dog barked because there was an intruder in the house” has told us that he understands and is able to express events that are causally related to each other.
- **Sentence Elaboration:** Students are asked to change simple, bare-bones sentences into sentences that are precise in their meaning and are descriptive and informative.
- **Logical Sentences:** Students are required to edit sentences for errors in semantics that arise from problems with incorrect subordination, omissions, pronoun referents, and mixed metaphors. This subtest measures reading skill as well as alertness to written errors that affect meaning. The student who recognizes that the sentence “The boy saw the moon who was walking down the street” is incorrect knows that the dependent clause (who was walking...) must follow the word that it modifies (in this case, “boy”).
- **Writing Fluency:** Students write legible, simple sentences while being timed using specified target words. Although this test is often used as a general measure of writing fluency, it only measures what it measures, that is, the ability to formulate simple sentences. It does not measure writing fluency with respect to complex sentences or larger organizational structures, such as paragraph writing, and it may overestimate the writing speed of students who struggle with how to link and structure their thoughts.
- **Contextual Sentence Writing:** Writing samples are analyzed for the presence of different sentence types, as well as for vocabulary, semantics, and mechanics.

Research on the different ways that written expression can be assessed at the sentence level is limited. When assessing written syntax, it is important to remember, however, the adage

“what you test is what you get.” Sentence formulation tasks, for example, do not require students to spread their linguistic wings. Any grammatical bare-bones simple sentence will do.

It is, therefore, up to us as evaluators to pay close attention to referral questions and to have a strong understanding of the component skills that support the development of written expression. For instance, if we do not test handwriting and transcription skills, then we cannot answer the most fundamental questions regarding the foundation of basic writing skills—Can students control their pencils and execute basic rules for sound-symbol correspondence?

If we do not test sentence combining, we cannot actually understand a child’s ability to balance the demands of content and syntax. Although children may complete fill-in-the-blank tasks and demonstrate an understanding of noun/verb agreement, we must wonder whether they can avail themselves of the linguistic tools required to express their thoughts with precision and flexibility in sequence. In contrast to fill-in-the-blank tasks, sentence combining represents, at a most crucial level, the intersection between language and thought, and whether we can express subtle relationships between facts and ideas.

Risk Signs for Written Syntax

Regardless of the type of sentence-level task, evaluators should observe their examinees for skill and ease of letter formation and handwriting, use of space, spelling, and rules for capitalization and punctuation. Evaluators may also want to comment on children’s efforts to use subvocalization and repetition as a way of using their inner voices to guide their pencils. Children at risk for writing challenges often exhibit the following signs and behaviors:

- Weak graphomotor skill (i.e., the manual dexterity needed to write letters, along with the ability to picture the letters in mind and mentally plan the line strokes)
- Difficulty writing the alphabet with legibility and automaticity
- Weak expressive language skill and/or poor word retrieval
- Weak working memory
- Sentences that lack descriptive language (adverbs, adjectives, and phrases)
- Repetitive sentence structure, often in the form of subject-verb-object (SVO) order; for example, “I like ice cream. I eat it every day. I eat it for breakfast...”
- The presence of sentence fragments and run-on sentences
- Awkward and nongrammatical constructions; lack of noun/verb agreement
- Poor mechanics
- Poor use of space
- Reluctance to write

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TABLE 2. Tests and Subtests Measuring Aspects of Syntax

Subtests Measuring Specific Aspects of Syntax	Age/Grade	Dictation/ Copying	Sentence Formulation	Fill-in-the Blank/ Completion	Sentence Combining	Sentence Elaboration	Logical Sentences	Writing Fluency	Sentences in Context of Story or Essay
Test of Adolescent and Adult Language—Fourth Edition (TOAL-4; Hammill, Brown, Larsen, & Wiederholt, 2007)	Age: 12-24				√				
Test of Written Language—Fourth Edition (TOWL-4; Hammill & Larsen, 2009)	Grade: 4-11	√	√		√		√		√
Wechsler Individual Achievement Test—Third Edition (WIAT-III; Pearson, 2009)	Age: 4-50 Grade: K-12		√		√				√
Woodcock-Johnson III Tests of Achievement (WJ III ACH; Woodcock, McGrew, & Mather, 2001)	Age: 2-90+ Grades: K-17+		√ [†]	√ [†]				√	
Tests of Written Expression with Sentence-Level Items									
Kaufman Test of Educational Achievement—Second Edition (KTEA-II; Kaufman & Kaufman, 2004)	Grade: 1	√	√	√					
	Grade: 1 & 2	√	√	√	√				√
	Grade: 3-5	√	√	√	√				√
	Grade: 6+		√	√	√				√
Oral and Written Language Scales—Second Edition Written Expression Scale (OWLS-II; Carrow-Woolfolk, 2011)	Age: 5-7	√	√	√					
	Age: 8-10		√	√	√	√			√
	Age: 11-13	√	√	√	√	√			√
	Age: 14-16	√	√	√	√				√
	Age: 17-21	√	√	√	√	√			√
Process Assessment of the Learner—Second Edition (PAL-II; Berninger, 2007)	Grade: K-6		√						
Test of Early Written Language—Third Edition (TEWL-3; Hresko, Herron, Peak, & Hicks, 2012)	Age: 3-7		√		√				√
√ [†] Part of WJ-III Writing Samples subtest									

Adapted from M. Farrall (2012). *Reading assessment: Linking language, literacy, and cognition*. Hoboken, NJ: John Wiley and Sons, Inc.

Despite what test publishers, both formal and otherwise, might claim, there is, at this point, no single instrument or statistic that will permit us to describe an individual's skill in written syntax and thereby establish a foundation for instruction and remediation. Written expression, even at the sentence-level, is built on cognitive, linguistic, and graphomotor skills that, in turn, support our ability to express higher-level thinking skills with precision, grammar, and style.

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