Chapter 2
Indicators of Fluent Writing in Beginning Writers

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Learning to read and write are significant achievements in a child's education, and many children seem to pick up reading and writing skills with ease. They become fluent readers and writers and are able to coordinate reading and writing activities with seemingly little effort. But not all children learn to write with the same ease. Consider the case of Toby.

Toby is a happy, precocious first grader who loves to learn. He listens intently when his teacher, Mrs. Wright, reads aloud to the class, and participates enthusiastically in class discussions. During independent reading time, he devours books about dinosaurs, fossils, and rocks. He loves science, and often draws intricate

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pictures to illustrate the science topics discussed in class, describing them with detailed precision to his classmates. Mrs. Wright often jokes that he has the vocabulary of a paleontologist.

Despite his excitement about learning, Mrs. Wright has noticed that Toby has great difficulty with handwriting, spelling, and written composition. For example, Toby often shares elaborate stories of his family's camping excursions, relates what he recently learned at the science museum, or makes up harrowing adventure tales about himself and his dog. Yet, when Mrs. Wright encourages him to write about these ideas in his daily journal, he typically only writes a few words—such as "I like rocks," "I went fishing," "I saw a big bird." Mrs. Wright has noticed that he forms each letter with painstaking care, and he often stops to ask her or a peer how to spell a word. Toby usually takes the entire 10 min allotted for journal writing to write these few words. Even then, his writing is often barely legible, with many erasures and crossings-out. Sometimes he gets frustrated and tears up his paper or wads it into a ball.

Mrs. Wright is concerned that, over time, Toby's struggles with writing will decrease his excitement about school and learning.

This case example illustrates a child who is not a fluent writer, particularly due to his difficulties with handwriting and spelling, which comprise the transcription component of writing. Though Toby appears to have no trouble *generating* text—in the form of elaborate, articulate stories and explanations—getting his ideas onto paper is extremely difficult. His attention is consumed by forming letters and words, reserving little capacity for translating his sophisticated ideas into written text. For Toby, writing can be a frustrating activity, and his written production is not a good indicator of his ideas.

Early identification and intervention will be critical for students with writing problems, including students like Toby, to develop overall writing proficiency (Berninger, Nielsen, Abbott, Wijsman, & Raskind, 2008; Berninger et al., 2006), which will in turn have an impact on their long-term success in school and beyond (Graham & Perin, 2007). Early identification and intervention require assessments that can be used to establish current levels of writing proficiency, as well as to monitor progress in response to instruction and supplemental intervention. These assessments should focus on aspects of writing that serve as global indicators of fluent writing.

This chapter reviews existing work on the role of fluency in assessing writing, specifically when applying curriculum-based measurement (CBM; Deno, 1985) approaches to assessing fluent writing. We focus on work conducted at the early stages of writing development, from prekindergarten to third grade. This period is targeted because of the importance of early writing development, increased attention to writing instruction at these grades, and the need for further research that informs how fluent writing develops. We hope this chapter serves to further the conversation about appropriate approaches for assessing writing at early stages of writing development.

The first section of this chapter reviews the importance of writing and provides a description of writing fluency, drawing from definitions of reading fluency operationalized by CBM. It is followed by a review of measures that have been developed as indicators of writing; these measures directly or indirectly target fluency. Next, the chapter discusses the correlates of writing and how assessment can inform writing instruction and intervention. The chapter concludes with a discussion of directions for future research.

Importance of Writing

Like reading, writing is important to academic and vocational success. By the time a child enters formal school settings, many foundational literacy skills have begun to develop, and the ability to express ideas in writing is further cultivated by academic instruction and experiences. The importance of writing has been highlighted in recent years for two reasons: the importance of writing to academic and vocational success and the poor writing of many students in the United States.

First, writing is critical to overall literacy development (Biancarosa & Snow, 2004). Writing provides students with the means to communicate what they know (Graham & Perin, 2007), is important for integrating knowledge and thinking critically (Shanahan, 2004), and can also "be a vehicle for improving reading" (Graham & Hebert, 2010, p. 6)**.** Second, far too few students develop proficient writing. In fact, data from the most recent National Assessment of Educational Progress (National Center for Educational Statistics, 2012), indicate that only 30 % of students in grades 8 and 12 performed at or above the "proficient" level (defined as solid academic performance) in writing. This widespread lack of writing proficiency is problematic given that a majority of jobs require employees to write proficiently at work (National Commission on Writing in America's Schools and Colleges, 2004). In addition, many students with specific learning disabilities or other learning needs have more trouble writing than their peers do (Graham & Harris, 2005). For example, students with learning disabilities often experience significant difficulties with handwriting, spelling, and mechanics, as well as difficulties generating ideas and organizing, planning, and revising their writing (Troia, 2006).

These discussions have pointed to the need to improve writing instruction in schools. The National Commission on Writing (2003) called writing the "neglected 'R.'" They called for comprehensive writing standards and proposed that writing should be built into "every curriculum area and at all grade levels … from the earliest years through secondary school" (p. 5). While writing instruction has been identified as important and as an area for improvement at many points in the past decade (Biancarosa & Snow, 2004; Graham & Perin, 2007; National Commission on Writing, 2003), legislative attention has focused more heavily on improving reading, especially as part of *Reading First* and *No Child Left Behind* initiatives.

More recently, the development of the Common Core State Standards (National Governors Association & Council of Chief School Officers, 2010) has drawn increased attention to the instructional targets for writing for the US students. Nearly every state (45 states and the District of Columbia to date) has adopted the Common Core State Standards which delineate writing expectations for students beginning in kindergarten. The Common Core State Standards describe specific expectations for students to write across genres and to produce text that meets standards for writing conventions (e.g., syntax, mechanics). A summary of grade-level expectations is presented in Table 2.1. These expectations require high-quality instruction with sufficient opportunities to practice writing.

Table 2.1 Common Core State Standards in Writing. (Adapted from the Common Core State Standards in Writing for K-third grade)

Writing Grades K-2		
Category		Skill
Text types and purposes	1.	Students should be able to create a product where they talk about a book and provide an opinion about the book with supported reasons.
	2.	Students should be able to create informative/explanatory texts where they are able to produce a topic and provide information on it.
	3.	Students should be able to describe or write a narrative event or sequence of events and discuss them with organization as well as react to what happened.
Production and description of writing	4.	Students should answer questions and respond to suggestions made by their peers in order to build up their writing.
	5.	Students should be able to participate in research projects, explore books, and express opinions in writing.
Research to build and present knowledge	6.	Students should be able to participate in research projects including exploring books and expressing opinions use them in writing.
	7.	Students should be able to remember information from personal experiences or be able to gather information from a provided source in order to answer a question.
Writing grade 3		
Category	Skill	
Text types and purposes	1.	Students should be able to write opinion pieces with support for a point of view.
	a.	Students should be able to provide a topic, give an opinion, and organize reasons for that opinion.
	b.	Students should provide reasons for their opinion.
	c.	Students should use linking words and phrases in order to connect reasons and opinions.
	d.	Students should provide a conclusion statement or section in their writing.
	2.	Students should be able to write informative and explanatory pieces that examine a topic and conveys ideas and information clearly.

Table 2.1 (continued)

Writing Grade 3		
	a.	Students should be able to pick a topic, examine it, and convey information and ideas about the topic clearly.
	b.	Students should be able to develop the topic using facts, definitions, and details.
	c.	Students should be able to use linking words and phrases to connect ideas and information.
	d.	Students should provide a conclusion statement or section in their writing.
	3.	Students should be able to write narratives to develop either real or imagined experiences, and include events while using effective techniques, descriptive details, and clear event sequences.
	a.	Students should be able to establish a situation, create a narrator and characters while organizing a sequence of events that has a natural progression.
	b.	Students should be able to use dialogue, describe actions, thoughts, and feelings of characters to create an experience or show the response of a character to a situation.
	c.	Students should be able to use temporal words and phrases to create organization and signal order.
	d.	Students should provide a sense of closure within their story.
Production and distribution of writing	4.	With scaffolding and guidance, students should be able to produce writing with clear organization and development for its intended purpose.
	5.	With scaffolding and guidance, students should be able to improve their writing as needed through the use of planning, revising, and editing.
	6.	With scaffolding and guidance, students should be able to use technology to publish their writing in addition to interacting and collaborating with others.
Research to build and present knowledge	7.	Students should be able to conduct research projects to facilitate building knowledge about a topic.
	8.	Students should be able to remember information from personal experience or be able to gather information from print sources as well as digital sources, and be able to sort the evidence into categories.
Range of writing	9.	Students should be able to write routinely over extended periods of times including time for research, reflection, and revision (or shorter time frames) for a range of tasks, purposes, and audiences.

Student performance on these standards will be assessed in newly developed assessment programs aligned to the Common Core State Standards. These assessments may require many school systems and teachers to use formative writing assessment and to provide feedback on their students' writing performance. With these new standards, it is possible that many schools will need to make substantial changes to

how they assess and teach writing in the early grades, especially as reading instruction has dominated literacy instructional time. It will be critical to consider stages of writing development within these assessments and instructional techniques. Even if high-stakes writing assessments are not included until later grades, the early grades should provide the foundation to develop critical writing skills including acquisition of and fluency in the component processes of writing. What remains unclear is the best way to accurately and efficiently assess writing proficiency and growth in a way that can inform instruction and maximize student progress within the curriculum and toward grade-level standards.

Fluent Writing

Our current efforts have focused on the development of measures of writing for children in prekindergarten to third grade, with a specific interest in developing measures that fit into a CBM framework and that could serve as global indicators of fluent writing. The focus has been on defining appropriate tasks (i.e., what students are asked to do) and the scores (i.e., how the written product is evaluated) that provide the most technically adequate indices of writing proficiency.

Using Principles of CBM to Define Fluency

Work in CBM began almost 40 years ago by Stan Deno and colleagues as part of the Institute for Research on Learning Disabilities (IRLD) at the University of Minnesota. One of the goals of the IRLD was to develop a set of efficient and simple assessment procedures that could provide information about "vital signs" of academic health. These vital signs are often referred to as "global indicators" that can be used to indicate whether a student is making sufficient progress toward important academic goals, or whether a lack of progress indicates an underlying problem, such as a learning disability that requires further diagnosis and instructional changes or intervention (Deno, 1985).

Deno (1985) established key criteria for CBM. First, the measures are designed to provide information about a student's proficiency and progress in academic areas such as reading, math, and writing. These measures use brief, direct observation of academic behaviors in ways that could be both efficient and yield scores that are reliable and valid indicators of academic outcomes. These academic outcomes are drawn from the curriculum to ensure alignment between the provided instruction and the assessment. Additionally, because the measures are to be used to monitor progress, they are designed to be sensitive to growth, meaning that the measures should yield scores that could be influenced by small amounts of learning. For example, the score might be expected to increase by one or two (or more) "points" when students were administered the tasks weekly or biweekly (Fuchs,

Fuchs, Hamlett, Walz, & German, 1996). Research on CBM has been conducted in core academic areas such as reading, mathematics, spelling, written expression, and content areas (see Foegen, Jiban, & Deno, 2007; McMaster & Espin, 2007; Wayman, Wallace, Wiley, Ticha, & Espin, 2007 for reviews).

CBM work in reading informs our work in developing CBM assessments for writing. For example, in reading, the most common CBM approach involves direct assessment of a student reading aloud from grade-level text while the number of words read correctly (and errors) in 1 min are recorded. At the elementary level, students' scores on CBM Passage Reading Fluency (also called Oral Reading Fluency) have strongly correlated with standardized reading measures (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Wayman et al., 2007), suggesting that CBM Passage Reading Fluency provides the type of global indicator of reading that Deno and colleagues were seeking. Further, the measures have been found to distinguish among students of different skill levels, to be useful for identifying students who may be at risk for reading disabilities (Jenkins, Hudson, & Johnson, 2007), and to be sensitive to growth made in brief time periods (Wayman et al., 2007).

We draw from the assertion that reading can be assessed by asking students to read text and that *reading fluency* can be identified as a global indicator of proficient reading. We posit that *writing fluency* can be assessed by asking students to write in response to a prompt and identifying the fluency of their response as a global indicator of proficient writing. We acknowledge that, as global indicators, this approach to assessment will not completely capture all of the many important aspects of writing, but that the derived scores do have instructional utility. Specifically, these indicators provide scores that can indicate whether a student is on track to meet important academic standards or is experiencing difficulties and is in need of further diagnosis and intervention.
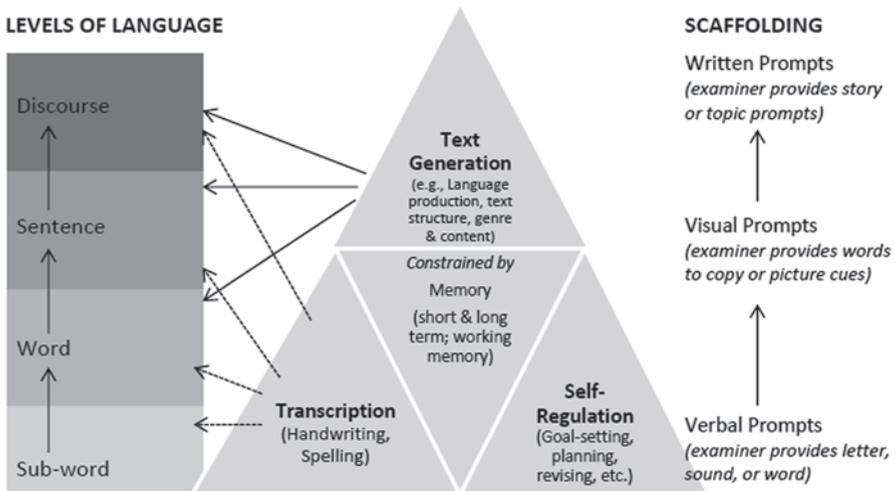
Defining Fluent Writing

Given our focus on developing global indicators of fluent writing, we turned to the CBM reading literature for a fluency definition. Deno and Marston (2006) define fluent *reading* as the way that "an individual easily processes text and that the processing of text encompasses both word recognition and comprehension" (pp. 179–180). Applying this definition to fluent *writing*, we propose that it is the way an individual easily *produces* written text, and that the generation of written text encompasses both *text generation* (translating ideas into words, sentences, paragraphs, and so on) and *transcription* (translating words, sentences, and higher levels of discourse into print). Thus, fluent writing comprises the ease with which an individual both generates and transcribes text. Below, we describe these components within a theoretical model of writing, provide operational definitions, and explain how the simultaneous execution and coordination of these components contributes to fluent writing.

Components of Fluent Writing: Transcription and Text Generation

The text generation and transcription components of writing are derived from the seminal work of Hayes and Flower (1980), whose model of writing specified three key writing processes: planning, translating, and reviewing/revising. Researchers (e.g., Berninger, 2009; McCutchen, 2006) have further specified this model for early writing development. For example, Berninger and Amtmann (2003) described a "simple view of writing" that divides the translating process into two key components—text generation and transcription—and groups planning and reviewing/revising into a third component comprising self-regulatory processes. These three components can be presented in a triangle, such as that depicted in Fig. 2.1, with transcription and self-regulatory processes at the base, and text generation at the peak (Berninger & Amtmann, 2003). Fluent execution and coordination of these components is constrained by cognitive resources, such as short-term, long-term, and working memory (Berninger, 2009; McCutchen, 2006). Lack of automaticity (or execution of a process with little or no attention), in lower-level transcription processes constrains the higher-order processes involved in text generation, as well as for planning, organizing, and revising written text. For example, in the case example presented at the beginning of this chapter, Toby's lack of automaticity in handwriting and spelling constrains his attentional capacity such that he is only able to generate and write down simple words and sentences even though his ideas are more complex.

Further, development of the transcription and text generation components of writing occurs at multiple levels of language, including sub-word, word, sentence,

Fig. 2.1 This figure illustrates the "simple view of writing" (Berninger & Amtmann, 2003). Fluent writing is constrained by memory, which can influence automatic execution of any of three components. Further, in the measures described in this chapter, transcription and/or text generation are assessed at each level of language. While self-regulation is not directly assessed, scaffolding is provided in the form of verbal, visual (e.g., pictorial), or written prompts to support children's regulation of each type of task

and discourse levels (Whitaker, Berninger, Johnston, & Swanson, 1994). At the sub-word and word levels, children develop awareness of the alphabetic principle and graphophonemic relations and begin to transcribe letters, sounds, and words (Ehri, 1986). As children gain awareness and use writing conventions, they begin to separate words with spaces and thoughts with punctuation (Tolchinsky, 2006), and thus generate and transcribe text at the sentence level. As they gain knowledge of content and writing genres, they begin to produce longer units of writing at the discourse level (McCutchen, 2006).

Figure 2.1 illustrates how the component processes of writing (text generation, transcription, and self-regulation) are constrained by cognitive resources and develop across four levels of language (sub-word, word, sentence, and discourse). Work conducted by our research teams and others has included a search for global indicators of fluent writing for young children by tapping transcription (early in development) and text generation (as development progresses) across the four levels of language. Of note, self-regulatory processes in isolation have not been specific targets of these assessments; rather, the tasks provide varying levels of scaffolding (using verbal, visual, or written prompts) to support beginning writers' regulation of text generation. Below, we provide operational definitions of the components of the writing construct to be measured (transcription and text generation).

Transcription

Transcription is the process of encoding sounds, words, sentences, and larger units of discourse into print, and involves both handwriting and spelling. For skilled writers, these skills are executed with automaticity, such that they require no or few attentional resources (e.g., Berninger, 2009; McCutchen, 2006; also see LaBerge & Samuels, 1974 for a seminal paper on automaticity). Handwriting involves the integration of orthographic coding [the "ability to represent a printed word in memory and then to access the whole word pattern, a single letter, or letter cluster in that representation" (Berninger & Rutberg, 1992, p. 260)] and those components of the motor system involved in executing the process of translating those words into print (Berninger, 2009). Beginning writers must allocate significant working memory resources to this orthographic-motor integration, which constrains higher-order writing processes. Handwriting is thus an important component of early writing assessment.

Spelling also involves orthographic coding, along with phonological coding (analysis and synthesis of phonemes in words; Berninger & Swanson, 1994). Like handwriting, spelling presents a significant challenge for young writers (e.g., Graham, Harris, & Fink-Chorzempa, 2002) and thus can place significant constraints on the development of other writing processes. Theoretical models of spelling development specify stages of qualitatively different approaches to spelling words (e.g., Ehri, 1986; Ehri & McCormick, 1998; Treiman & Bourassa, 2000a, 2000b). Accounting for differences across developmental stages in spelling is likely to be useful in capturing early indices of students' developing progress in writing.

Text Generation

Text generation is the process of "turning ideas into words, sentences, and larger units of discourse" (McCutchen, 2006, p. 123), and is distinct from transcription of ideas into actual print (Berninger & Swanson, 1994). Text generation draws on linguistic sources including vocabulary knowledge (Coker, 2006; Kim et al., 2011; Olinghouse & Leird, 2009) as well as knowledge about topic and genre (McCutchen, 2006). As with transcription, text generation is constrained by cognitive resources. For example, working memory resources can constrain the writer's ability to avoid grammatical errors and maintain linguistic connections within and across sentences and larger units of text. Long-term memory resources are related to knowledge of topic and genre, which can constrain quality and quantity of text generation.

Like transcription, text generation has been demonstrated to be uniquely related to overall writing proficiency. Skilled writers are able to generate language more efficiently than less skilled writers, and this efficiency is a key predictor of writing quality (Dellerman, Coirer, & Marchand, 1996). This finding holds true for children just beginning to develop writing skills. For example, Juel, Griffith, and Gough (1986) reported that the number of ideas generated uniquely predicted first and second graders' writing quality. Efficiency with language leads to greater language production and thus longer texts, and text length has been found to provide a strong index of text production as well as quality (Berninger & Swanson, 1994).

While transcription and text generation are distinct components that are predictive of overall writing proficiency, there is a necessary interplay between these components for writing to occur. Both transcription and text generation involve a complex coordination of component processes (e.g., orthographic, motoric, linguistic) that place considerable demands on cognitive resources needed for writing (Berninger, 1999). We hypothesize that measures that tap the development and automatization of transcription skills will serve as global indicators of children's developing writing proficiency early on, but that measures that tap both text generation and transcription will quickly become important as children gain automaticity in their transcription skills. These global indicators are intended to identify students who may be at risk for writing difficulties and thus in need of further diagnostic assessment (beyond CBM), which would be used to develop specific interventions. In the next section, we describe assessments that hold promise as global indicators of beginning writing in prekindergarten to third grades.

Assessment of Fluent Writing

Given our operational definition, our research teams have used the transcription and text generation constructs to develop and refine assessments that have potential to serve as indicators of fluent writing. As noted above, our work has been an extension of the work on CBM by Deno and colleagues which led to the development of the story prompt task (Deno, Mirkin, & Marston, 1982) which asks students to provide a written response for 3–5 min. An example of a story prompt completed by