The Importance of Automaticity and Fluency For Efficient Reading Comprehension

by Pamela E. Hook & Sandra D. Jones

The reading process involves two separate but highly interrelated areas–word identification and comprehension. It is well established that difficulties in automatic word recognition significantly affect a reader's ability to efficiently comprehend what they are reading (Lyon, 1995; Torgesen, Rashotte, and Alexander, 2001). Even mild difficulties in word identification can pull attention away from the underlying meaning, reduce the speed of reading, and create the need to reread selections to grasp the meaning. Many students who struggle to learn to read are able, with appropriate instruction, to compensate for initial reading problems by becoming accurate decoders but fail to reach a level of sufficient fluency to become fast and efficient readers. Thus, the development of techniques for improving automaticity and fluency is critical. Although the research is clear that a systematic alphabetic approach to teaching beginning and struggling readers is more effective than a whole word approach (Adams, 1990; Chall, 1996; Snow, Burns, and Griffin, 1998), the most effective ways to develop fluency are less well understood. Although current research has given us some direction about effective methods for increasing fluency (National Reading Panel, 2000), further systematic research is needed to give us more comprehensive answers to questions concerning the best methodologies, types of materials, and length/intensity of interventions necessary for optimal gains. The purpose of this article is to suggest some techniques that are consistent with the research and have been found to be either clinically effective or logically appropriate.

What are Automaticity and Fluency?

Automaticity is defined as fast, accurate and effortless word identification at the single word level. The speed and accuracy with which single words are identified is the best predictor of comprehension. Fluency, on the other hand, involves not only automatic word identification but also the application of appropriate prosodic features (rhythm, intonation, and phrasing) at the phrase, sentence, and text levels.

Wood, Flowers, and Grigorenko (2001) emphasize that fluency also involves anticipation of what will come next in the text and that speeded practice alone is not sufficient. Anticipation facilitates reaction time and is particularly important for comprehension.

What are the relationships among phonemic awareness, phonics and orthographic reading?

The ability to read fluently develops during Jeanne Chall's Stage 2 of reading, Ungluing from Print, which for most students occurs around second to third grade. (For a complete discussion of Chall's stage theory of reading acquisition, please see Chall, 1983.) This is the last stage where the student is developing skills related to "learning to read" and after this stage, the child will be required to shift to an emphasis on "reading to learn." The type of text being read shifts from being primarily narrative to expository and the language complexity of the written material begins to increase dramatically (including vocabulary level, sentence complexity, and text structure). The importance of background knowledge for comprehension also increases. Fluent reading at this point is essential.

Automatic reading involves the development of strong orthographic representations, which allows fast and accurate identification of whole words made up of specific letter patterns. English orthography is generally alphabetic in nature and initially word identification is based on the application of phonic word attack strategies (letter-sound associations). These word attack strategies are in turn based on the development of phonemic awareness, which is necessary to learn how to map speech on to print. It is important to keep in mind that prior to the stage where children read orthographically, they apply alphabetic strategies to analyze words (Frith, 1985).
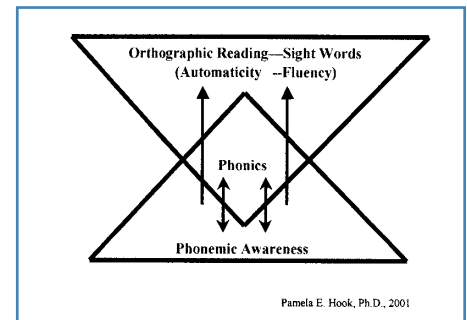

Figure 1. Relationships Among Phonemic Awareness, Phonics and Sight Word Recognition Skills.

Figure 1 illustrates the relationships among the processes involved in word identification. The bottom of the figure depicts a strong base in phonemic awareness upon which word identification skills are built. There is, however, a reciprocal relationship between the development of phonemic awareness and the development of phonic word attack strategies. As the child becomes more familiar with letters, phonemic awareness also improves. Ultimately, strong underlying orthographic patterns begin to emerge.

Most children go through this process relatively seamlessly, moving easily from the use of alphabetic strategies to the formation of strong orthographic representations that can be accessed automatically. There is, however, a percentage of "at risk" children (approximately 20-40% depending on the specific school demographics) who benefit from having phonemic awareness and phonic word attack strategies systematically taught. There is also a smaller percentage of children who will need more intensive work in this area (See Sanders 2001 for a more in-depth discussion). The children who struggle the most with learning to read also fail to develop adequate automaticity (orthographic reading) and need structured, systematic training in this area. It appears that early preventive intervention may be particularly important in the development of automaticity and fluency (Torgesen et al., 2001).

WORD LEVEL – AUTOMATICITY

How do we develop this automatic, orthographic reading ability in our students?

In the beginning–the six syllable types

One of the most powerful tools to begin instruction in this area is the visual patterns inherent in the six syllable types (Steere, Peck and Kahn, 1988). (See Figure 2.)

Figure 2. The Six Syllable Types

1. **closed—<u>not</u>**
   (closed in by a consonant—
   vowel makes its <u>**short**</u> sound)

2. **open—<u>no</u>**
   (ends in a vowel—
   vowel makes its <u>**long**</u> sound)

3. **silent e—<u>note</u>**
   (ends in vowel consonant e—
   vowel makes its <u>**long**</u> sound)

4. **vowel combination—<u>nail</u>**
   (the two vowels together make a sound)

5. **r controlled—<u>bird</u>**
   (contains a vowel plus r—
   vowel sound is changed)

6. **consonant-l-e—ta/<u>ble</u>**
   (at the end of a word)

It is these letter (orthographic) patterns that signal vowel pronunciation. For example, while one or more consonants at the end of a syllable (closed syllable type) signals a short vowel sound, a vowel at the end signals a long vowel sound, etc. Highlighting, underlining, or enhancing the saliency of the visual pattern in some way is recommended to direct the student's attention to the critical components of the orthographic image. Students must become able not only to apply their knowledge of these patterns to recognize the syllable types, but to see these patterns automatically, and ultimately read words as wholes rather than through the application of phonic word attack strategies. This need to move from decoding to automatic recognition was recognized years ago by Anna Gillingham when she incorporated the Phonetic Word Cards activity into the Orton-Gillingham lesson plan (Gillingham and Stillman, 1997). This activity involves having the student practice reading words (and some nonwords) on cards as wholes beginning with simple syllables and moving systematically through the syllable types to complex syllables and two-syllable words. The words are divided into groups that correspond to the specific sequence of skills being taught.

Accent

In addition to acquiring phonic word attack strategies, prosodic features at the word level such as stress on syllables are important. At times, poor readers can accurately decode a word but true recognition of the word eludes them because they have not correctly accented one of the syllables. Dyslexic students often have difficulty hearing the accented syllable in a word, so teachers should first determine if a student is able to discriminate and identify through listening alone. If a student cannot hear differences, lessons should begin with listening practice and then move to oral production. Visual and tactile/kinesthetic strategies can be incorporated with listening if necessary.

A teacher can begin to practice listening for and producing accented syllables using the alphabet. The alphabet is presented in pairs and one letter of the pair is accented until a student is successful. The teacher begins presenting the accent only on the first letter until the student is consistent and then presents the accent only on the second letter. When a student can do both of those successfully, the teacher can then present mixed pairs to practice (e.g., **A**´B **C**´D **E**´F or G**H**´ I**J**´ K**L**´ or **M**´N O**P**´ **Q**´R). Instruction should move as quickly as possible from using the alphabet to using real words. The teacher can begin with names to practice listening for accented syllables (e.g., **Court**´ ney, Mich **elle**´, **Ty**´ ler, Je **sus**´).

Mirrors can be used for visual reinforcement so students can see that their mouths open wider when they produce an accented syllable. If students need more reinforcement, they can place their hands along their jawline and feel the jaw opening wider on the accented syllable. Visual signals such as bolding or accent marks can be used to indicate which syllable is accented. Manipulatives such as tokens or blocks can also be used to indicate accent placement by moving the token for the accented syllable higher than the tokens for the unaccented syllables (see Bell, 1997 for a complete description of this approach.)

Training and Linking the Orthographic Processor

Although most students learn to apply the rules of phonic word attack strategies and later of prefix, stem, and suffix through multisensory, structured, systematic teaching techniques and become quite accurate in their reading, many remain slow and laborious. They have trouble moving to the next level of automatic orthographic reading and thus comprehension suffers. Even adults who have seemingly compensated for their reading difficulties still require extended time when taking tests. These students need systematic training in the development of strong orthographic representations that will allow them to read quickly and effortlessly.

Approaches have been developed that use a variety of repeated reading strategies to strengthen these orthographic images. The automatic recognition of single graphemes is a critical first step to the development of the letter patterns that make up words or word parts (Adams, 1990). English orthography is made up of four basic kinds of words: 1) regular for reading and spelling (e.g., <u>mat</u>, <u>sprint</u>); 2) regular for reading but not for spelling (e.g. <u>boat</u>, <u>rain</u>–could be spelled "bote" or "rane" respectively); 3) rule based (e.g., <u>planning</u>–doubling rule, <u>baking</u>–drop e rule); and 4) irregular (e.g., <u>beauty</u>–it should be noted that most parts of an "irregular" word are actually regular and only the irregular part needs to be specifically addressed).

Students must learn to recognize all four types of words automatically in order to be effective readers; thus, techniques for developing strong orthographic representations for all types of words are essential. Extensive opportunity for repeated practice in pattern recognition is often necessary. In order to strengthen the letter patterns associated with the six syllable types and other rule based orthographic patterns in English (such as e, i and y signaling the pronunciation of c and g), Fischer (1994) has developed drills to "train the orthographic processor" which involve having the student mark the vowels long or short based solely on the letter patterns contained in the word. They do not actually read these words, but instead

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focus attention on the letter patterns. The next step is to "link the phonological and orthographic processors" which involves saying only the vowel sound of the words rather than reading the word. Again, the focus is primarily on the orthography. Other ways of emphasizing orthography would be card sorts where students sort different syllable types into appropriate categories as quickly as possible and then say the vowel sounds of each syllable type as quickly as possible.

Single word level word drills–regular and irregular words

Once these orthographic signals have become automatically recognized, the students complete speed drills in which they read lists of isolated words with contrasting vowel sounds that are signaled by the syllable type. For example, six to eight closed syllable and vowel-consonant - e words containing the vowel *a* are arranged randomly on pages containing about 12 lines and read for one minute. Individual goals are established and charts are kept of the number of words read correctly in successive sessions. The same word lists are repeated in sessions until the goal has been achieved for several sessions in a row. When selecting words for these word lists, the use of high-frequency words within a syllable category would increase the likelihood of generalization to text reading. (See the SPIRE program, Clark-Edmands, 1998, for word lists based on frequency.)

These same kind of speed drills can be used for irregular words as well as multisyllable words that incorporate higher-level concepts of structural analysis (prefix, stem, and suffix). At the multi-syllable level, automatically recognizing both the visual patterns related to syllable division as well as prefixes, stems, and suffixes (larger chunks) can be very helpful. The syllable division rules around vccv and vcv syllable patterns can train the student to recognize visual patterns that signal pronunciation. The SPIRE program contains speed drills that at first mark these syllable breaks as well as prefixes and suffixes and then fade the cues as the student progresses through the drill.

Air writing–development of symbol imagery

In addition to repeated readings of words or word parts, specific techniques have been developed to strengthen the orthographic representations by the use of multisensory activities that link the motor and visual modalities to reinforce the auditory. Tracing, copying, and writing words have long been a part of many multisensory, structured language approaches. (e.g., See Gillingham and Stillman, 1997 and Raines, 1980 for a complete discussion of these techniques.) Sky writing, which involves using gross motor movements of the whole arm to form letters in the air, has also been used to help reinforce single letter formation by combining visual, auditory and tactile-kinesthetic cues. More recently an air writing technique has been included as a component of a program intended to improve symbol imagery, or the formation of orthographic representations (i.e., *Seeing Stars* Nanci Bell, 1997). This technique involves having the student look at a word or word part pronounced by the teacher, name the letters, and then use his finger to write the word in the air directly in his visual field while looking at his finger. The student then reads the word from memory and the teacher questions him about the order and placement of specific letters in the word (e.g., "What is the third letter in the syllable?" "What is the second letter?" etc.). The emphasis here is on enhancing the students' ability to "see" the letter patterns in their minds.

Text Level–Fluency

The lack of fluency in poor readers is evidenced by their slow, halting, and inconsistent rate; poor phrasing; and inadequate intonation patterns. Not only do good readers read fluently with adequate speed, but when they read aloud, they also use appropriate phrasing, intonation, and their oral reading mirrors their spoken language. Although practices that incorporate prosodic reading have not produced stronger fluency gains (Torgesen et al., 2001), application of appropriate phrasing and prosodic features is important for comprehension and should be directly addressed particularly with children who do not do this naturally. If fluency is a stepping-stone to comprehension, then it is necessary to help readers transition from decoding text to constructing meaning by connecting the prosodic features that are inherent in text to their established spoken language system. If their spoken language system is intact, making this connection allows a reader to self-monitor and self-correct, which in turn facilitates the comprehension of text.

Fluency training helps a student to connect the prosody of spoken language to the prosodic features of text that are signaled through punctuation. There are features present in spoken language that provide clues to a speaker's intent such as gestures, facial expression, intonation, and stress that are not present in printed text. The absence of these prosodic features in text inhibits some readers from chunking words (grouping by semantic and syntactic features) into meaningful units. Just as we teach students to make sound-symbol correspondences during decoding instruction, we also must teach readers to map the prosodic features of spoken language onto the printed text. Structured and systematic instruction in this area will facilitate spoken-to-print prosodic correspondences and enhance comprehension.

Intonation/Punctuation

To begin to develop awareness of the prosodic features of language, teachers can introduce a short three-word sentence with each of the three different words underlined for stress (e.g. <u>He</u> is sick. He <u>is</u> sick. He is <u>sick</u>.). The teacher can then model the three sentences while discussing the possible meaning for each variation. The students can practice reading them with different stress until they are fluent. These simple three-word sentences can be modified and expanded to include various verbs, pronouns, and tenses (e.g. <u>You</u> are sick. <u>I</u> am sick. <u>They</u> are sick.).

This strategy can also be used while increasing the length of phrases and emphasizing the different meanings (e.g. <u>Get</u> <u>out</u> of bed. Get out of <u>bed</u>. Get out of bed <u>now</u>.). Teachers can also practice fluency with common phrases that frequently occur in text. Prepositional phrases are good syntactic structures for this type of work (e.g. *on the _____, in the _____, over the _____, under the _____, etc.*).

Teachers can pair these printed phrases to oral intonational patterns that include variations of rate, intensity, and pitch. Students can infer the intended meaning as the teacher presents different prosodic variations of a sentence. For example, when speakers want to stress a concept they often slow their rate of speech and may speak in a louder voice (e.g. *Joshua, get-out-of-bed-**NOW**!*). Often,

the only text marker for this sentence will be the exclamation point (!) but the speaker's intent will affect the manner in which it is delivered. Practicing oral variations and then mapping the prosodic features onto the text will assist students in making the connection when reading.

This strategy can also be used to alert students to the prosodic features present in punctuation marks. In the early stages using the alphabet helps to focus a student on the punctuation marks without having to deal with meaning. The teacher models for the students and then has them practice the combinations using the correct intonational pattern to fit the punctuation mark (e.g., ABC. DE? FGH! IJKL? or ABCD! EFGHIJ? KL.).

Teachers can then move to simple two-word or three-word sentences. The sentences are punctuated with a period, question mark, and exclamation point and the differences in meaning that occur with each different punctuation mark (e.g. *Chris hops. Chris hops? Chris hops!*) are discussed. It may help students to point out that the printed words convey the fact that someone named Chris is engaged in the physical activity of hopping but that the intonational patterns get their cue from the punctuation mark. The meaning extracted from an encounter with a punctuation mark is dependent upon a reader's prior experiences or background knowledge in order to project an appropriate intonational pattern onto the printed text. Keeping the text static while changing the punctuation marks helps students to attend to prosodic patterns.

Phrasing and Chunking Text

Students who read word-for-word may benefit initially from practicing phrasing with the alphabet rather than words since letters do not tax the meaning system. The letters are grouped, an arc is drawn underneath, and students recite the alphabet in chunks (e.g., ABC DE FGH IJK LM NOP QRS TU VW XYZ). Once students understand the concept of phrasing, it is recommended that teachers help students chunk text into syntactic (noun phrases, verb phrases, prepositional phrases) or meaning units until they are proficient themselves. Text can be formatted for the student or the student may write the phrases on an erasable sheet. There are no hard and fast rules for chunking but syntactic units are most commonly used.

Short phrases with familiar words can be introduced through chunking machines. A chunking machine is a tachistoscope that allows a student to pull the reformatted or chunked text through the window to increase speed of recognition. (See Figure 3 for an example of a chunking machine.) It is important to put comprehension questions at the beginning and end of this activity. Students benefit from an advanced organizer before reading to help them anticipate what they will be reading. The same series is read until students can pull the phrase strips through quickly and answer all of the questions correctly. Chunking machines are simple to make and allow the student to focus on small portions of text at one time. If teachers wish to emphasize one particular word that is important for comprehension, they may chunk it separately or underline it for stress. Once text has been reformatted, students can transfer these phrases to the cards and make chunking machines for each other.

Slash Marks

For older or better readers, teachers can mark the phrasal boundaries with slashes for short passages. Eventually, the slashes are used only at the beginning of long passages and then students are asked to continue, "phrase reading" even after the marks stop. Marking phrases can be done together with students or those on an independent level may divide passages into phrases themselves. Comparisons can be made to clarify reasons for differences in phrasing.

Another way to encourage students to focus on phrase meaning and prosody in addition to word identification is to provide tasks that require them to identify or supply a paraphrase of an original statement. There are semantic paraphrases and syntactic paraphrases (Pearson and Johnson, 1978). Some examples follow:
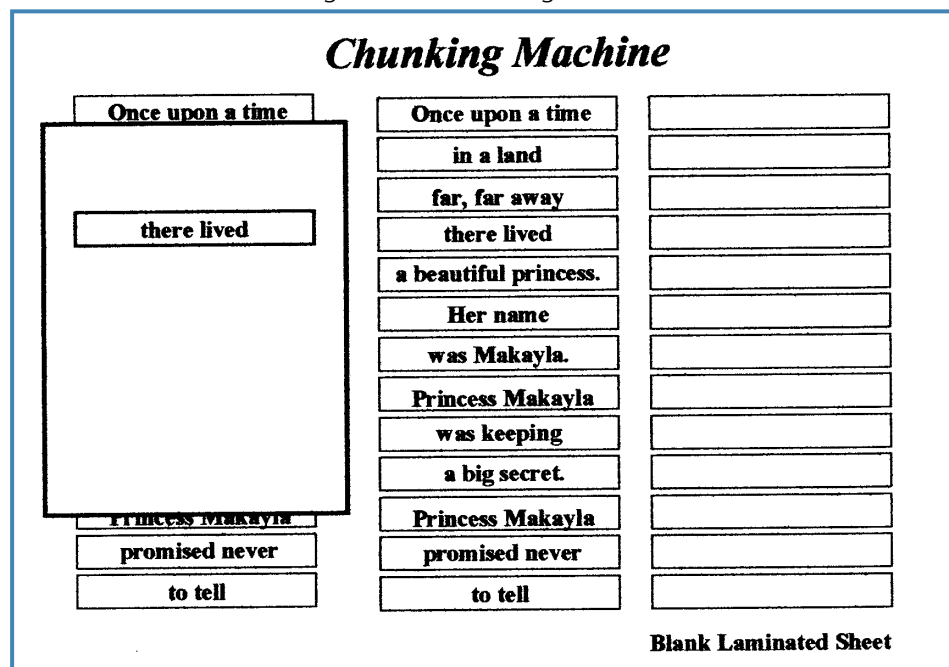
Semantic Paraphrase
Jim jumped over the bushes.
Jim leaped over the hedge.
Syntactic Paraphrase
Jim flew the kite. (active voice)
The kite was flown by Jim.
  (passive voice)

Teachers can change the punctuation and vary intonation of paraphrases to increase student's ability to quickly adapt to changes. Discussion can focus on the differences between "jumped over the bushes" and "leaped over the hedge." "Leaped" is a somewhat more interesting image so students might give it more stress during oral reading. They could then replace it with "bounded over the shrubbery" and discuss if this paraphrase changes the meaning and practice reading

Figure 3. The Chunking Machine

Chunking Machine

Once upon a time	Once upon a time	
	in a land	
	far, far away	
there lived	there lived	
	a beautiful princess.	
	Her name	
	was Makayla.	
	Princess Makayla	
	was keeping	
	a big secret.	
Princess Makayla	Princess Makayla	
promised never	promised never	
to tell	to tell	

Blank Laminated Sheet
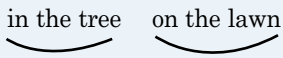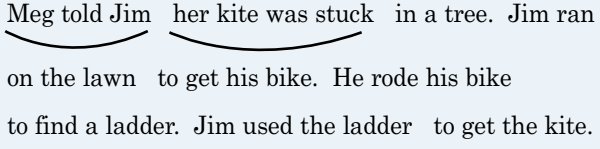
it. Because texts in different content areas tend to contain slightly different syntactic patterns, diverse reading of undemanding materials in different subjects and genres can be valuable during activities for improving fluency and comprehension.

Scooping

The incorporation of a multisensory component of scooping under syntactic chunks may benefit some students as they read at the text level, where the appropriate application of intonation and stress in conjunction with speed and accuracy are considered primary. The following is a suggested progression for repeated readings of a paragraph that incorporates systematic work at the phrase and sentence levels:

1. Student reads the paragraph (after discussion of the content) orally (perhaps tape-recorded for comparison).

2. Student reads selected phrases from the paragraph while scooping under them with the finger or a pencil.

   in the tree   on the lawn

3. Student reads selected sentences from the paragraph individually while scooping phrases (with spaces between the phrases).

   1. Meg told Jim   her kite was stuck   in a tree.

4. Student reads the paragraph while scooping sentences within the passage (with spaces between the phrases).

   Meg told Jim   her kite was stuck   in a tree.   Jim ran

   on the lawn   to get his bike.   He rode his bike

   to find a ladder.   Jim used the ladder   to get the kite.

5. Student reads the paragraph as a whole without scooping and without spaces.

6. This reading is compared to the first reading in terms of fluency (accuracy, speed, and rhythm). In the beginning, timing a student as he or she reads connected text may not be as important as monitoring that he or she is applying prosodic features and chunking the text into syntactic units. Timing may be incorporated once rhythm has been clearly established.

Developing Anticipatory Set

As noted above, in addition to repeated readings and other sorts of speeded practice, it has been suggested that fluency is enhanced by being able to anticipate what is to come in the text, which in turn enhances comprehension. Wood et al. (2001) suggest that in addition to activities that involve developing automaticity, helping children to predict what is coming next is important. "Setting the stage" through activation of prior knowledge and reviewing what will be happening in the story can be instrumental in helping students predict text content. Summarizing the story and discussing the characters or previewing the pictures to get ideas of what the story may be about may serve the purpose of improving anticipatory set and thus enhance fluency. Other commonly used strategies such as reviewing the vocabulary and comprehension questions before reading the passage may also be helpful in this regard. (See the *J and J Language Readers*, Greene and Woods, 1993 for examples of these kinds of activities.)

Summary

Effective reading comprehension requires not only accurate reading skills but also automatic and fluent reading ability. Many struggling readers have difficulty moving to a level of automaticity and fluency that allows them to easily comprehend what they are reading. We have discussed the underlying processes involved in developing fluent reading as well as suggested some techniques for improving fluency. Research in the area of developing accurate decoding has consistently indicated that a systematic code based approach is important for teaching beginning reading skills. The best techniques for developing fluency, however, have not yet been clearly established. The suggestions here are based on clinical experience and more systematic research is needed to determine which methods or their components will be the most efficient.

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Additional Resources

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