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Self-monitoring in beginning reading

This article discusses the development of self-monitoring and searching behaviors in beginning readers.

Have you ever played the game of 20 Questions with a 5- or 6-year-old? They have their own style. When my son, Michael, was that age he would point to different objects asking, "Is it this?" After 7 or 8 guesses, I was tempted to say "Yes! You got it!" To be helpful, I could explain how more general questions reduce the options and lead to a quick solution. Unfortunately, in my experience this never works! So I take a turn trying to guess what he is thinking. Is it on this side of the room? Is it on the floor? Is it bigger than a bread box (as if any 6-year-old knows what that is)? If this demonstration succeeds at all, Michael might begin his next turn asking, "Is it on this side of the room?" before switching back to his original strategy, "Is it this?"

Clay (1993b) finds a useful analogy between the processing involved in this simple game and reading. "The smarter readers ask themselves the most effective questions for reducing uncertainty; the poorer readers try lots of trivial questions and waste their opportunities to reduce their uncertainty" (p. 9). As primary teachers, we see this processing game played out every day. Our high-progress students are driven by questions like, What is this

story about? Did my attempts make sense in this story? Does it look right and make sense? What can I do to solve this problem?

Struggling readers are still trying to figure out the game. Over the last 5 years, I've used Reading Recovery® procedures to help some of the lowest performing first-grade students become literacy players. I've also observed hundreds of other similar students as they work with Reading Recovery teachers to build effective strategies. You can see and hear them working on the game. Marty, a first grader I worked with, said things like, "No, that's not right!" "Don't tell me. I can get it!" or "Uh oh!" as he worked to solve the problems he encountered.

Teaching for strategies is a key part of literacy instruction in the primary grades and for older students struggling with reading. The difficulty is that telling students what to do is even less effective in a complex task like reading than in the simpler context of the 20 Questions game (Cazden, 1992). The purpose of this article is to describe how we can foster this type of processing. First, I set the stage by describing reading strategies and cues we use rather automatically. Then I distinguish between two types of processing strategies that play a central role in learning to read: monitoring and searching. Next, I present oral reading samples to show how children extend the set of cues they use to monitor their reading. Finally, I provide some classroom implications for assisting young readers to develop effective processing strategies.

Cues we use

The following passage engages readers in processing a variety of cues (based on Goodman, 1993, p. 94). Try to read it out loud with good phrasing.

> The Boat
>
> A man was building a boat in his cellar. As soon as he had finished the boot he tried to take it through the the cellar door. It would not go though the door. So he had to take it a part. He should of planed better.

This brief passage is filled with opportunities for checking cues, many that you probably noticed as you read aloud. In normal reading, we coordinate a variety of cues from the text. Visual and phonological information within words (print cues), the grammatical structure of the text (sentence structure cues), and the meaning derived from prior sections of the text (meaning cues) provide information sources that interact with the reader's knowledge to support ongoing word recognition and comprehension strategies (Adams, 1990; Clay, 1991; Goodman, 1985, 1993; Rumelhart, 1994). The problems inserted in this passage create conflicts among these cues. Readers may notice these conflicts, just as you might notice an error made while reading normal text. Most readers get to the word *boot* and notice the conflict between print cues from the letters and meaning cues from the context of the story. At this point, they often shift from a meaning orientation to a proofreading task giving greater emphasis to gathering print cues. Proofreaders sometimes work backwards through a document to avoid meaning cues that might cause them to overlook typographical errors. In this passage, since many of the print cues in altered words combine with meaning to confirm incorrect responses, the reader might say *through* for *though* or *planned* for *planed*. Many readers will not notice these slight visual conflicts caused by a single letter difference.

Should of raises additional problems in place of *should've*. The print cues are easily processed and recognized, both *should* and *of* are known words. The substitution even sounds right (phonological and sentence structure cues) within the overall context. With this degree of agreement among cues the rather vague meaning conflict between *of* and *have* is often not noticed. *A part* for *apart* raises similar problems.

By far, the most difficult problem to notice is the *the the* repetition between the third and fourth lines. Early in first grade, Marty would have had no difficulty reading both *the's* in this type of situation because he was very carefully looking at (and often pointing to) each word he said. Let's hope he would have complained that this didn't sound right. As good readers, we read with expression and phrasing by letting our eyes work ahead of our voice. As we gather information on the fly, our processing systems coordinate or ignore partial information from two glances (fixations). Our normal use of meaning, sentence structure, and print cues almost ensures that we will not see the second *the*.

The processing you did in reading this passage demonstrates the complex set of mental strategies that readers need in order to coordinate cues from different information sources, evaluate their progress, and shift between comprehension and word recognition processes when difficulties arise. This set of in-the-head strategies is much more complex than any set of rules or suggestions that we can tell children. Much of what we do is difficult to describe even in the most detailed text on the psychology of reading. Even if we could somehow describe what we do (like our suggestions for the 20 Questions game), it is unlikely that describing rules or processes would be helpful.

So how can we help? By carefully observing reading behaviors, we can infer the types of cues and strategies children use. Given these tentative theories of processing, we can then support their efforts to extend the set of cues they attend to and strategies they use as they read. The degree and type of support needed will vary among children until their network of strategies is sufficiently developed that they can extend their own strategies to meet the demands of increasingly complex texts. This is what Clay (1991) calls a self-extending system.

Two types of processing strategies

The conflicts among cues in *The Boat* passage require readers to coordinate two major types of processing strategies, searching and monitoring. Searching strategies enable us to

gather cues for an initial attempt to read a text, make multiple tries at difficult words, and self-correct some errors. Self-monitoring strategies enable us to evaluate our attempts and decide if further searching is needed. Most discussions of methods for beginning reading instruction focus on searching strategies and largely ignore the role of monitoring. Teaching procedures like phonics instruction, use of context cues for word recognition, and solving words by analogy to known words are designed to foster searching strategies.

When self-monitoring has been considered in beginning reading instruction, the focus has usually been to encourage children to check whether their attempts make sense. This is important, but ignoring other types of monitoring strategies and cues can be self-defeating. It is a little like having a teenager who can do a variety of household tasks. Now that my son is almost a teen, he can do many chores and usually doesn't even mind doing them. But somehow he never notices that a chore needs to be done. I can nag him to do each task, but unless he notices the cues in the environment himself, like cans and dishes by the TV or soccer clothes on the bathroom floor, real independence never develops. Attending to the situation and noticing when things aren't quite right is monitoring. Extending the set of cues a child searches for when reading depends on the child noticing that his/her current attempt requires further work.
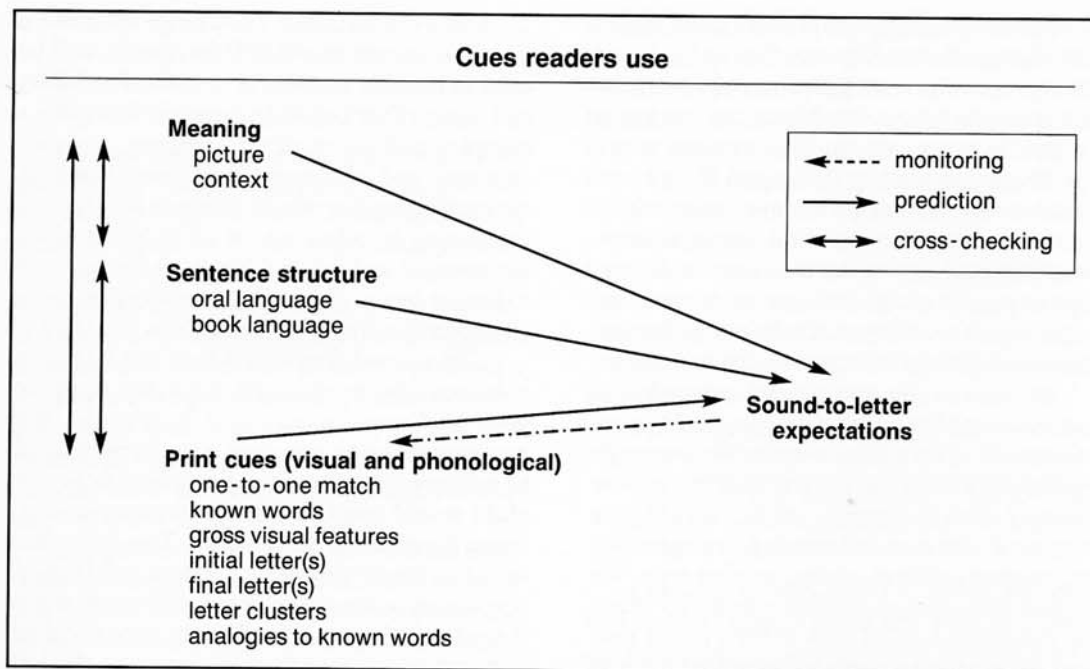
Monitoring strategies involve checking one's attempts to coordinate the variety of cues found in texts. These monitoring strategies develop gradually, often over a period of years, and play a critical role in learning to read (Clay, 1991). Self-correction is an observable behavior from which we can infer that the reader has engaged in monitoring and searching strategies. Self-correction means that the reader has used some cues from the text to generate an attempt, then either immediately, or after reading on in the text, s/he monitors a conflict among the cues. This is illustrated in *The Boat* passage when the reader reaches *boot*. If the print cues generate an accurate response, a skilled reader usually notices that this does not fit the meaning. In a normal text, monitoring an error would lead the reader to search for additional cues to resolve the conflict. If this effort is completely successful an error would be replaced with an accurate response, self-correction. It is more important to foster the development of monitoring strategies in beginning readers than to stress highly accurate responding.

Observing cues used for self-monitoring

Clay (1991) has developed a theory of literacy learning that assigns a central role to monitoring strategies. An important question for beginning instruction is, "How can we support the development of a highly efficient and coordinated set of monitoring and searching strategies?" A necessary first step is to carefully observe the types of behaviors that signal strategic processing. Our best window into the child's processing comes from analyzing errors or miscues (Goodman & Goodman, 1994). A correct response neatly fits all the available cues. But this does not imply that a child accurately reading a simple pattern book is using or monitoring all cues. By analyzing the child's errors, we can infer the types of cues used and those neglected. Behaviors at the point of error, or shortly after an error, suggest the types of cues the child is monitoring. Monitoring is indicated when an error is followed by rereading all or part of the sentence, by making several attempts at a word (including self-correction), by showing signs of dissatisfaction, or by appealing for help (Clay, 1991).

The Figure is a modified version of Clay's (1993a) representation of the primary cue systems used in reading. Any given error can be analyzed in terms of the cues or information sources that are used and those that are neglected. These include meaning cues from the illustrations or the context of the story; sentence structure cues from the word sequence within the sentence and the child's developing knowledge of oral language and the more formal language of books; print cues from words and letters and the reader's knowledge of how these visual cues relate to sounds (phonological cues); and cues from the relationship of sound-to-letter expectations. A child's pattern of responses and whether s/he checks or notices conflicts between attempts and other possible cues indicate his/her level of monitoring. An important question for instruction is not Does the child monitor? but rather, What types of cues does the child use to monitor his/her attempts?

Cues readers use

Meaning
picture
context

Sentence structure
oral language
book language

Sound-to-letter expectations

Print cues (visual and phonological)
one-to-one match
known words
gross visual features
initial letter(s)
final letter(s)
letter clusters
analogies to known words

- - - - ◄ monitoring
———► prediction
◄——► cross-checking

One-to-one matching. Consider some possible readings of the text in Example 1. In a one-line pattern book with illustrations of different things a baby can do, the first reading (R1: "The baby is smiling and playing a trick") would clearly fit the meaning and an acceptable language structure. The match to print cues is more problematic. Marty read simple books in this manner at the beginning of first grade. He accepted this reading without hesitation. He monitored for meaning and sentence structure but had not yet come to terms with reading for a precise message or monitoring for a match between his developing concept of a word in oral language and words in print. For many young children, this is an appropriate response on which future learning can build. The child uses knowledge of the world and language to "problem solve" the task at hand and reaches an acceptable solution. Within a few lessons, Marty began to extend his monitoring strategies on new books, commenting, "I know it doesn't say all that" after this type of response.

Example 1

Text: Baby can laugh.

R1   The baby is smiling and playing a trick.

R2   Baby laughing.

R3   The baby laughed.

R4   Baby is laughing.

The second reading (R2) represents another child's solution to the challenge of this text. Again meaning is maintained, but the one-to-one correspondence of words in oral and written language doesn't match. This could represent progress over the previous response. The child pointed to each word in the text and monitored the correspondence between oral and written language. So why doesn't he notice he is one word short? In a long word like *laughing*, beginning readers often operate on a theory of matching one word in print to each beat in oral language. Saying and hearing the syllables in *hippopotamus* can cover quite a few written words for a reader operating on this theory. The concepts of a word in oral language and a word in written language are complex. Children like Marty, who enter school with little knowledge about print, require many literacy experiences and demonstrations before they monitor their own reading consistently by cues of one-to-one matching (Clay, 1991; Morris, 1992).

The third reading (R3) fits meaning, structure, and matches one-to-one. The fact that this attempt doesn't fit all the print cues is irrelevant if matching oral words to word spacing is the level of processing the child is ready to notice. The fourth reading (R4) again fits the previously used cue types with much more visual similarity on the first and third words. If, however, the child knows the word *can* or *is*, perhaps as part of his/her writing vocabulary, we might expect some signs of monitoring discrepancies related to print cues from known words.

As you can see, reading even a simple text requires complex problem solving and the coordination of a variety of cues. With enough repetitions, a child can learn to read much more complex texts accurately, but this serves little purpose if s/he does not develop strategies that will support problem solving in other texts. We support independent problem solving by praising children's uses of cues in their initial miscues and prompting them to extend the types of cues they use to monitor these attempts. This is particularly important for young children who are just beginning to use print cues. It can also be important for older readers who are having difficulty because of an imbalance in the cues they use for problem solving.

Known words. The remaining examples focus on extending the kinds of print cues used for self-monitoring. Example 2 relates to monitoring by "known words." This text comes from a slightly more complex pattern book with a supportive illustration in which a child waves to different friends who drive by as he waits for the school bus. The first reading (R1) again fits meaning, structure, and print cues, and the printed words match one-to-one with words in the child's oral reading. Since Marty has demonstrated knowledge of *my*, *to*, and *the* in writing stories and is matching one-to-one, he could use this knowledge to monitor his attempts. Words controlled in writing are a better indication of knowledge of words than accurate reading of the words in stories. The fact that a child has correctly responded to a word may not mean that he knows it. Accurate book reading could be achieved solely based on the use of meaning and structure cues.

Example 2

Text: I wave to my friend the car driver.
R1   I wave at the man driving the car.
R2   I will to my friend the car man.

But even detailed knowledge of a word does not ensure that this information will be used to monitor reading in context. For Marty and many other beginning readers it is quite a complex task to coordinate meaning, sentence structure, and print cues from known words. A supportive teacher might promote this type of processing by allowing the child to complete the sentence and then reading back the sentence to him or her as s/he said it, encouraging monitoring in this shared context: "Was that right?"

The second reading (R2) in this example achieves a better visual fit across the sentence with all known words read accurately. But meaning and structure cues have been ignored to achieve this visual fit. We would hope the child would monitor this discrepancy and attempt to reprocess the sentence. This early, tentative strategic processing where one type of cue is searched to produce an initial guess and is then checked against another cue type is called cross-checking (see double arrows on the left side of the Figure). Our goal is to help the child extend the set of cues s/he monitors, not to shift attention from meaning to visual cues.

Sound-to-letter expectations. Example 3 focuses on monitoring cues from sound-to-letter expectations where there are gross differences between the child's prediction and the visual features of a word in text. The text again comes from a slightly more complex pattern book with a supportive illustration. Different animals make suggestions to a boy about what he might like on his sandwich. A cat suggests a mouse; a lizard suggests a spider; and then on this page, a bird makes a suggestion. The picture shows a fat purple worm on bread.

The difficulty comes because of the insertion of the adjective into the established language pattern. Marty initially tried to read this as "would you like a worm," but monitoring of one-to-one matching triggered another attempt. Marty's first reading (R1) is a reasonable solution to this problem using meaning cues from the picture. But since he is beginning to generate sound-to-letter expectations, this prediction was rejected because of the lack of agreement between the dominant sounds in *purple* and the visual features of *fat*. Another attempt results in the second reading (R2). Since *funny* shares some visual features with *fat*, Marty accepts this as a reasonable solution to the problem.

Example 3

Text: Would you like a fat worm?

R1   Would you like a purple worm?

R2   Would you like a funny worm?

How do children learn to monitor gross visual features within words? Early writing experiences help children learn to hear and record sounds in words, as do procedures that promote invented spelling during group or individual writing (Lyons, Pinnell, & DeFord, 1993) or various forms of phonics instruction (Cunningham & Allington, 1994). The ability to go from a word in oral language to using letters to represent sounds in the word is a major accomplishment. This sound-to-letter emphasis is different from the letter-to-sound emphasis often associated with early phonics instruction.

The process Marty used to monitor gross visual features is illustrated in the Figure. Marty's initial search of meaning, structure, and/or visual cues produced a word prediction, which allowed him to access his knowledge of sound-to-letter expectations. If he said the predicted word slowly and thought about the letters he expected to see, as Marty does to write unfamiliar words, he could check these letter expectations against the print, e.g., "I think it will say *purple*. I hear two *p*s, but I don't see them, so it can't be *purple*." Eventually this process becomes integrated with other strategies to provide a rapid form of visual monitoring of words identified based on a limited set of cues. Monitoring by sound-to-letter expectations is gradually refined to detect more detailed discrepancies between predictions based on multiple cue sources and print cues from initial letters, final letters, familiar letter clusters, or analogies to known words.

Some children will need prompting to apply this knowledge to monitoring their reading. The miscue is my opportunity to foster self-monitoring and searching strategies. I could validate the good processing reflected in Marty's first reading by confirming that it made sense. Then prompting Marty to check if it looks right and makes sense will encourage him to engage in the reading work that will extend his set of strategies (Clay, 1993a).

If I just focused on searching strategies, I might point to the word *fat* after the substitution of *purple* and prompt Marty to "get his mouth ready" for the initial sound. But pointing to the error eliminates Marty's opportunity to self-monitor. Now if he rereads and integrates the initial visual cue with meaning and sentence structure cues to generate *funny*, I might ignore this successful processing and continue to nag him to sound out the word. However, these would be serious mistakes in my efforts to assist Marty's development of independent processing strategies. "It is more important that the child comes to check on his own behavior than that he be required to use all sources of cues at this stage" (Clay, 1993a, p. 41).

Clay (1991) notes that children making good progress learning to read

> were using "predict and check" in many cases as a substitute for letter-sound decoding, in situations where their print knowledge was inadequate. These intermediate skills enable a reader to use prediction to narrow the field of possibilities and to reduce the decoding load. (p. 254)

Checking or monitoring is critical. Instruction that encourages prediction without fostering increasingly complex forms of monitoring runs the risk of producing readers who are limited by inefficient orthographic and phonological processing (Schwartz & Stanovich, 1981; Stanovich, 1980).

Phonics-based instruction, on the other hand, fosters attention to visual and phonological cues, but at a cost. The mental effort of processing and blending even one or two letters is considerable for young readers. This requires children to shift attention away from meaning and sentence structure cues. Many children need our support to extend the cues they find effective, rather than changing to a purely visual approach. We risk creating poor readers who take a word-by-word approach to reading when we prompt primarily for searching visual cues in order to "sound it out" (Clay, 1993a; Lyons, 1994).

Letter-sound knowledge and strategies can be effectively developed in the context of reading books and writing stories. Using meaning, structure, and a gradually increasing set of print cues for initial searching helps to reduce the processing required for successful reading. Monitoring many accurate predictions and some errors increases knowledge of the relationship among meaning, structure, and print cues. Teachers can help children extend the set of cues used to monitor their reading and then gradually integrate these newly noticed cues with others used in searching. This is a critical

mechanism that supports development of reading strategies.

Fostering self-monitoring in primary classrooms

High-progress readers monitor their reading and extend the set of cues they use within the context of literate classroom and home environments. Low-progress readers, like Marty, tend not to construct this system of strategies without instructional support. This support can also benefit primary-level readers.

In many classrooms, self-monitoring during oral reading seems almost impossible. Children may monitor for the reader, informing him or her immediately and loudly when an error occurs. However, group contexts can be established to foster self-monitoring. A poster like the following might help establish this context.

Readers know that:
1. Good readers think about meaning.
2. All readers make mistakes.
3. Good readers notice and fix some mistakes.

These simple tenets can lead to negotiating procedures: (a) to allow each reader time to discover and fix his/her own mistakes; (b) to provide help when requested; and (c) to enable members of the group to note, analyze, and suggest errors (only one or two) for discussion after a student has finished reading and the meaning of the section has been established. With initial teacher modeling, these discussions can shift the focus of reading from accuracy to interpretation and strategy development (Brown & Palincsar, 1989; Pressley et al., 1992; Taylor & Nosbush, 1983).

Low-progress readers, like Marty, tend not to construct this system of strategies without instructional support.

Goodman (1996) describes several settings in which readers engage with their teacher or peers to analyze and discuss miscues and strategies. The following transcript is an excerpt from a guided reading lesson (Fountas & Pinnell, 1996) for a group of Title 1 second-grade students. Early in the year the group generated questions to help them when they encounter difficulties in reading. The teacher recorded these questions on a chart and modeled how they might be used to assist a student at points of difficulty. One rule was that no person should tell another student a word without first prompting that student to "problem solve" the word. After the teacher introduced the story, each child read the story as the teacher circulated, observing reading behaviors and providing assistance at points of difficulty. Early in the year, children read these stories quietly, aloud to themselves; later they read silently. When the group finished this initial reading and had a short discussion of the story, the children were invited to find a part in the story that was tricky for them. This led to the following collaborative problem-solving discussion:

John:	(reading) Before, when I was wild, I slept in the ... (stops at the word *stable*).
Teacher:	Who can help him? What can he try?
Arianna:	Where would a horse sleep? What would make sense?
John:	In a barn...but, that doesn't look right.
Arianna:	Think of something that would make sense and begin with those letters.
John:	(reading) Before, when I was wild, I slept in the st–st–sta–ble? Stable?
Teacher:	Yes, a stable is like a barn. In this story, the horse slept in the stable.

John identified a part of the text that caused him difficulty. After Arianna prompted him to consider meaning cues, John made a meaning-based attempt, *barn*, but monitored the conflict between this attempt and the print cues in *stable*. Arianna then prompted him to search both meaning and print cues. John reread to gather meaning and structure and then used print cues from letter clusters. Even with all this successful processing, John was still a bit unsure about his solution, so the teacher stepped in to confirm his strategy use by clarifying the meaning of *stable*.

Admittedly, this is an example of a highly effective interaction, but it does illustrate what is possible. This type of interaction allows the teacher to develop tentative theories about cues children use for monitoring and searching, which can then be used to provide "critical moment teaching" (Goodman, 1996). In this type of activity setting, both teachers and students take an active role in teaching and learning.

Why is this important? Lev Vygotsky suggests that social interactions drive cognitive development.

> Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. (Wertsch, 1990, p. 113)

This is a gradual process. The issues and procedures discussed by the group or with the teacher are interpreted, organized, altered by experience, and internalized as the basis for mental strategies. I suspect this is why telling a child how to play the game of 20 Questions is so ineffective. If we really want him/her to improve, we'd play as a team, hinting, prompting, modeling, and puzzling out the solution together as the child's strategies and independence increased.

Shared problem solving centered around self-monitoring, searching, and self-correction is the mechanism that Clay (1993a) has detailed in the Reading Recovery program to support the hardest-to-teach children. High-progress students often appear to develop this system of strategies with only minimal support from literate classroom or home environments. These high-progress readers learn from what we decide to teach, but they also fill in the gaps to construct a balanced set of monitoring and searching strategies.

Yet, for far too many children in our primary classrooms, learning to read has remained confusing, frustrating, and fraught with feelings of failure. Careful observation and attention to fostering self-monitoring strategies can help us ease this transition into literacy for many students (Lyons et al., 1993). As Clay (1991) concludes, "literacy activities can become self-managed, self-monitored, self-corrected and self-extending for most children, even those who initially find the transition into literacy hard and confusing" (p. 345).

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