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# Using Retrospective Miscue Analysis to Nurture Metacognition in Young Children

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Using Retrospective Miscue Analysis to Nurture Metacognition in Young Children

Angela M. Larmon

The College at Brockport

**Abstract**

This qualitative study explores the effects of introducing Retrospective Miscue Analysis (RMA) into a reading group comprised of elementary students who are struggling readers. It examines how RMA discussions are related to the field of metacognition and metacognitive awareness in students. Metacognition has been found to have significant impact on students' memory, knowledge of reading and mathematics strategies, and perseverance. Periodical surveys of both the students and their teacher along with audio recordings of RMA discussions within the reading group were used to analyze how RMA discussions would affect the mindfulness and conversational behaviors of the young struggling readers.

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## **Introduction**

A student sits in class and pretends to read a book during the class' scheduled independent reading time. She has become adept at the art of avoiding detection: she wants no one to know she is struggling to read because she aims to please. Carefully turning pages at timed intervals, she looks like an avid reader to the passerby, but a close observer would notice her eyes dart around the room whenever she knows the teacher is not looking. She entertains herself by alternately people watching and studying the pictures while the rest of the class enhances their literacy by enjoying their favorite books. Forty minutes later, she hasn't read more than a few sentences and still doesn't know the joy a book can bring. She's in second grade.

## **Topic and Research Problem**

Everyday students around the United States will sit in classrooms and work on reading, writing, and phonics in an attempt to learn to read. Many students are successful and thrive; they progressively read increasingly difficult books, utilizing a complex and flexible strategy system to discover the meaning of the text they read. However, some students will struggle. They have been present for the same lessons as their peers, and have had the same opportunity to read and learn in school, but they are not able to make sense of the text in front of them. There has been a variety of research (Wray and Lewis, 1997; Watson, 1996; Campione, 1987) suggesting that struggling readers are unaware of strategic problem solving elements (rereading, reading beyond an unknown word, using context clues, etc.) in their approach to reading tasks. This may cause a breakdown in these students' ability to strengthen their reading strategies so that they can adapt to new texts in new situations.

With every month that passes, struggling students often become more and more discouraged. These students may habituate reading behaviors that cause them to struggle even more. Perhaps these struggling students focus on “sounding out” words, becoming dependent on a teacher or peer to give them answers. The reading process for struggling students breaks down as they feel the crushing blow of failure. Hence these struggling students begin to believe they cannot and will not learn to read.

In 1969, *Reading Miscue Analysis (RMA)* was created to help students in secondary school who had struggled to read for so long they began to think of themselves as failures. The program was based on the research of Yetta Goodman, who suggested that readers could indeed analyze their own mistakes in reading (“miscues”) and describe their strategic thought process when they made the miscue. Ken Goodman called RMA “a window on the reading process” (Goodman, Martens, & Flurkey, 2014, p. 11), as it provided readers with a way of speaking about the reading strategies that they were using; thus, the students could begin to take ownership over the strategies and understand how to use them.

The key to RMA’s success is that it demystifies the strategic processes of reading, allowing students who were once unaware of their reading strategies reclaim control over their own thinking (Goodman, Martens, & Flurkey, 2014, p. 10). But while a slew of studies (Y. Goodman et. al., 2014; Bruner, 1997; Y. Goodman, Watson, and Burke, 1996, 2005) have been conducted supporting the effectiveness of RMA for students in late elementary and secondary school, little is known about its effects on the literacy of young elementary students (K-2) who struggle to read even after explicit classroom instruction. As previously stated, the key to RMA’s success is that it prompts students to take ownership of their thinking process when they are reading (Goodman, Martens, & Flurkey, 2014). In 1976, the Stanford University researcher John



Flavell recognized ownership of one's thought process as an interesting phenomenon that deserved its own field of study. It was Flavell who first used the term "metacognition" when referring to one having an awareness or control over their thought process (Fisher, 1979).

### **Significance of Problem**

According to Veenman, Van Hout-Wolters, and Afflerbach (2005), it is "likely that metacognitive knowledge and skills already develop during preschool or early school years at a basic level, but these skills become more sophisticated and academically oriented whenever formal schooling requires explicit usage of 'metacognitive repertoire'" (p. 8). Furthermore, there is evidence that links children with a greater metacognitive awareness, or repertoire, with being characterized as very capable child or "gifted" (Sternberg, 1983). Sternberg found that these students "know what they can and cannot do, and they know what will help them gain the knowledge that they need" (As cited in Fisher, 1998, p. 8).

However advanced some students' metacognitive awareness may be upon their entrance into school, their awareness did not develop in isolation. According to Wren (2002) and Gough and Hillinger (1980), children do not develop critical comprehension strategies the way they develop language—it is not learned by mere observation; rather, it requires direct instruction. It is therefore essential that teachers are aware of the best practices for cultivating metacognitive awareness in their students at the early elementary age. Yet, in a study survey conducted by Veenman, Kok, and Kuilenburg (2001), many teachers left blanks when asked how they actively integrated metacognition into their lessons.

Metacognition and meta-teaching (teaching that is designed to convey content while strengthening children's metacognition) are needed in classrooms as students who possess

metacognition show growth in memory and adaptability (Fisher, 1998). As RMA has been said to “demystify the reading process” (Goodman, Martens, & Flurkey, 2014, p. 12) by improving students’ awareness of their thought process during reading, it seems that RMA may be exactly the kind of meta-teaching that is needed by many young, struggling readers.

### **Rationale**

As an educator, I have had the opportunity to observe in many classrooms and hear the opinions and observations of many teachers. A common sentiment that united many of the teachers that I spoke with was they expressed concern over the lack of comprehension strategies of the struggling readers in their class. More specifically, the teachers I worked with expressed their belief that their primary concern was the lack of metacognitive awareness and, therefore, lack of awareness and control over the reading strategies that their students possessed. I, too, had felt the worry and frustration over students who seemed to make little to no progress in their reading possibly because of their lack of metacognitive awareness and lack of memory from the last time we discussed a strategy that could help them read better. I found myself wondering what it is that we as teachers were either not doing or could be doing better to help these students.

According to Y. Goodman, Retrospective Miscue Analysis focuses on both the teacher *and* the student discovering what knowledge the student already has about language and the reading process; this prior-knowledge is revealed through the student’s miscues as he or she reads a book excerpt for the teacher (Goodman, Martens, & Flurkey, 2014) By discovering what the child already knows, the teacher can recognize which knowledge the student needs next, which Vygotsky described as a “gradual increase in the student’s active conscious control of knowledge” (as cited in Fisher, 1998, p. 2).

The parallels between process and benefits of Retrospective Miscue Analysis and healthy progress of metacognitive awareness in children intrigued me. What if RMA could be adapted to suit the developmental needs of young children so that it could be used to boost the development of metacognitive awareness in our struggling readers before they fall behind?

### **Purpose for the Study**

This study is important because my research investigates the effects of using Retrospective Miscue Analysis to increase early elementary students' metacognitive awareness and repertoire. By implementing an abridged version of RMA for K-2 students, I study any changes in the reading process that take place in a small group for struggling readers as well as record any evidence of metacognitive awareness that is spoken aloud or displayed through students' actions. This analysis informs not only my teaching practice, but the teaching practices of my peers as well. It is my hope that my findings clarify more about the development of metacognition in my students so that future teaching practices will be refined to boost metacognition in all students and perhaps lay a strong framework for those students who have a delayed development of metacognition.

### **Research Questions**

There are three primary questions that form the basis of this investigation: What happens when we introduce retrospective miscue analysis in small group instruction for early elementary students? How will students use their learning about metacognition in their reading process? In what ways do RMA sessions affect teacher-student conversations in the early elementary grades?

### **Literature Review**

Metacognition is an important part of every learning process; metacognitive awareness has been linked to effective memory skills, knowledgeable use of strategies when solving unknown words and mathematical problems, and a confident outlook that nurtures persistence when presented challenging problems and situations (Ferguson, 1980; Sternberg 1983; Palinscar & Brown, 1984). Therefore, it is no exaggeration that Veenman (2005) named metacognition as “a most powerful predictor of learning”—one that when nurtured properly could lead to students being more successful in all areas of learning.

#### **Definition of Metacognition**

Flavell first introduced the term metacognition in 1976 to define “an individual’s own awareness and consideration of his or her cognitive processes and strategies” (As cited in Fisher, 1979, p. 1). While metacognitive knowledge was originally referred to as knowledge and control of one’s cognitive activities throughout the learning process, the field of metacognition has branched into several sub factors such as: metacognitive awareness, metacognitive memory, and metacognitive strategies. Overall, thinking with metacognitive awareness concerns an individual being aware of the way his or her mind works to memorize information, strategize a plan, and solve a problem (Fisher, 1979).

Lev Vygotsky was one of the first researchers to realize that effective learning “necessitates conscious reflective control and deliberate mastery” (As cited in Fisher, 1979, p. 2). In 1962, his work revealed that he had astutely noticed people learn new information by being aware of the relationship between new information and what they already know- a self-monitoring process. For most people, this self-monitoring system runs in the background of the

mind until it is alerted to the conscious mind that there is a problem or breakdown in understanding (Veenman, 2005).

Interestingly, in a 1983 study Sternberg and Davidson found the overall standout characteristic of the advanced or gifted students was that they possess more metacognitive awareness than their peers (p. 51-57). In his study, Sternberg interviewed his participants and found that the students that performed better on cognitive tasks were able to articulate what their mind could and could not do; furthermore, they knew what strategies could help them gain the knowledge that they would need to further their understandings. These findings were similar to what Piaget's work found: metacognitive awareness, or what he called "reflective abstraction," which develops in children through their growing awareness of self-conflict when their understandings are challenged or their strategies fail to solve a problem" (as cited in Fisher, 1998, p. 7).

It is important to understand that while cognitive and metacognitive thinking are intertwined, several researchers have posited that metacognition can be clearly differentiated from intellectual ability (Sternberg & Davidson 1990; Veenman, 2006; Veenman et. al., 2005). Sternberg believed that "metacognitive skills sit atop intellectual ability" (As cited in Veenman, 2005, p. 6), and that while intelligence may give students a head start in developing metacognitive awareness, it does not affect its developmental course. Veenman and his colleagues, Van Hout-Wolters and Afflerbach (2005), went a step further in arguing that metacognition may even make up for cognitive limitations.

### **Development of Metacognition in Young Children**

According to the researchers Veenman, Van Hout-Wolters, and Afflerbach (2005), it is likely that "metacognitive knowledge and skills already develop during preschool or early-school

years at a very basic level, but become more sophisticated and academically oriented whenever formal education requires the explicit utilization of metacognitive repertoire” (p. 8). More specifically, basic concepts about memory and everyday thinking skills such as retelling are known in early childhood, whereas metacognitive knowledge pertaining to the usefulness of organizational strategies and text comprehension develops later (Flavell, 2002; Justice 1985; Veenman, 2006).

### **Development of Metacognitive Awareness in Young Struggling Readers**

By contrast, Wray and Lewis (1997) found that many struggling readers are unaware of the strategic problem solving elements in their approach to comprehension tasks. This lack in awareness causes breakdowns in a student being able to access the generalized skills of the four metacognitive domains: summarizing, questioning, clarifying, and predicting, which enable a student flexibility in transferring their skills as they encounter different levels of text (Palinscar and Brown, 1984).

While the most students will naturally develop metacognitive awareness as they interact and listen to their parents, peers, and their teachers, there is much variance in children’s metacognitive abilities (Veenman et. al., 2005). Some students grow up surrounded by adults and peers modeling metacognitive thinking through thinking-aloud and discussing their thoughts. Other students, against all odds, grow up successfully developing metacognitive awareness despite the sparse opportunities to see metacognitive modeling. Yet, there remains a significant population from both metacognitively rich households and metacognitive deficient that cannot acquire a metacognitive repertoire of skills. Veenman and his colleagues hypothesize this may be due to the student’s lack of opportunity to see and use metacognitive awareness or because the student does not recognize the importance of investing effort in increasing his or her awareness.

According to Wren (2002) and Gough and Hillinger (1980), what is for certain is that children do not develop the metacognitive strategies needed to comprehend high school and college level texts on their own in the way they develop everyday language use. In order for a student to acquire the higher-level metacognitive thinking skills such as organizational strategies and text comprehension (Flavell, 2002; Justice 1985; Veenman, 2006) the student must receive direct instruction that targets the development of metacognitive awareness (Wren, 2002; Gough and Hillinger, 1980).

### **Metacognitive Instruction in the Classroom**

Successful metacognitive instruction does not exist in a void (Pressley, 2002). Pressley (2002) also states that metacognitive instruction needs to be embedded in content matter to ensure student connectivity, comprehension, and transfer. If metacognitive instruction is treated as a stand-alone subject, struggling students will likely be confused as to the practicality of using these theoretical metacognitive concepts (using context clues, breaking a text into manageable pieces for analysis, summarizing after each paragraph, etc.) to comprehend text and mathematical problems, (Brown & Palinscar, 1984; Masui & De Corte, 1999; Kramarski & Mevarech, 2013) Metacognitive instruction embedded in content will utilize think-alouds, and student practice, such as the WWW&H rule (What to do, When, Why, and How) when tackling situations that require explicit use of their metacognitive awareness (Brown & Palinscar, 1984).

### **A Model of Successful Meta-Teaching in the Classroom**

In a landmark study completed by Annemarie Sullivan Palinscar and Ann L. Brown in 1984, students were shown to increase in metacognitive thinking that positively affected their comprehension and transfer rates in the classroom. In the overall study, the researchers conducted two mini-studies: one over the summer with tutors working with students and another

during the school year with teachers working with students. In both cases, the tutors and teachers utilized reciprocal teaching (teacher and students taking turns to lead a comprehension-fostering discussion) to read and comprehend texts and then create questions that a teacher would ask students to further thinking. In the study, the teacher and students took turns creating questions for one another, and with each passing week all students in each group (four groups of six) began to create more intuitive questions and display indicators of metacognitive awareness in their speech (Palinscar & Brown, 1984). According to the researchers, the reciprocal teaching was successful in improving metacognitive awareness, and therefore important for a number of reasons. For one, the process of allowing students to take charge of the content knowledge through the creation of pertinent questions pushed the students to analyze and sort the information. Analysis and categorization are two metacognitive strategies that are used by successful students on a daily basis in the classroom (Palinscar & Brown, 1984). Secondly, the researchers tracked the students in their abilities eight weeks after the study and discovered that there was no drop in their abilities up to eight weeks later. This is important because it is evidence that the students in the study had internalized the taught metacognitive strategies, which supports the idea that reciprocal teaching is a successful way of supporting metacognition.

### **Metacognitive Awareness and Retrospective Miscue Analysis**

As previously stated, metacognitive instruction does not exist in a void (Pressley, 2001). Ken Goodman, the creator of Retrospective Miscue Analysis believed that a child's thinking does not exist in a void either; rather, everything a young reader does is caused by "their knowledge of the world, its languages, and what they believe about reading and their level of metacognitive awareness" (Y. Goodman, 1996, p. 15). Goodman (1996) has drawn attention to the fact that it is important for teachers to observe and consider what knowledge their young student readers



already have about language and the reading process that may cause them to make reading mistakes or “miscues.”

Ken Goodman first developed Retrospective Miscue Analysis in 1969. Its development sprung from a colleague astutely noticing that middle school students were able to reflect on their own reading process (Y. Goodman, Martens, Flurkey, 2014). Students, like teachers, began to see the importance of their miscues or substitutions—even unusual ones—as “acting syntactic or grammatical placeholders that provide support for meaning and act as windows into the reader’s mind” (Y. Goodman, 1996, p. 10). Students were often startled to realize that their miscues were indicative of their current thinking and misunderstandings, which created the “intuitive leap” that occurs when we learn from errors that startle us (as cited in Y. Goodman, 1996, p. 14).

The process of Retrospective Miscue Analysis proved to be especially powerful because readers who had built negative views about themselves as readers began to discover their brains did indeed have systems of strategies to help them; thus, these students learned that they were better readers than they had originally thought. Goodman calls this evolution the “revaluing of the reader.” Moreover, these readers discovered that many of the assumptions they made about reading were not true, such as: it is cheating to skip words, slow reading is bad reading, and good readers know every word and remember everything they read (Y. Goodman, 1996).

As students progressed through Retrospective Miscue Analysis sessions they began to change their mindsets from fixed to growth; that is, they became more willing to accept “keep going” strategies (growth mindset) in the belief that they would succeed instead of remaining “fixed” on failure (Y. Goodman, 1996). According to Y. Goodman (1996), what is most noteworthy is that “[the students] come to understand that reading is a meaning-making,

constructivist process influenced by their own investment and control over that process [metacognitive awareness]” (p. 15).

### **Summary**

Ferguson (1980) correctly points out that students should be encouraged by teachers to reflect on the kind of thinking that’s been either helpful or a hindrance, which is application of the kind of ideology that Vygotsky described as the active consciousness that leads to healthy metacognitive development (As cited in Fisher, 1979, p. 1). While metacognitive conversations may one day be internalized, it is at first particularly effective for young students when carried out aloud with a teacher or with peers (Y. Goodman, 1996). Ebert (2014) echoes this idea, stating, “Language abilities play an important role for acquiring metacognitive knowledge and thus, are inherently related to it” (p. 243). According to Y. Goodman (1996), one of the major theoretical concepts of emergent literacy is based on the view that the nature of children and children’s learning and development needs to remain child-centered, so teachers need to be well trained in theological, child-centered teaching strategies such as RMA so that they recognize the psychological and linguistic resources of their students.

### **Methodology**

The purpose of this research is to investigate the effects of using Retrospective Miscue Analysis to increase early elementary students' metacognitive awareness. Through implementation of a modified version of RMA for K-2 students, I aimed to study any changes in the reading process that take place in a small group of struggling readers as well as record any evidence of metacognitive awareness that is spoken aloud or displayed through students' actions.

### **Participants**

The participants I chose to make up the small groups and lead teacher had to meet specific requirements. First, the teacher Miss Call (pseudonym) is a literacy specialist who was eager to learn how to run a RMA session that can be modified for younger students. Miss Call has been teaching in her field for four years.

The student group consists of four early elementary students, because this study is seeking to study the effects of RMA on students who are younger than the typical RMA session's participants. Furthermore, the student group consisted of struggling readers who are not classified as special education students. In this study the term "struggling readers" refers to students who are having a hard time decoding and comprehending what they are reading.

### **Setting**

The setting of my study is a rural school district in Western New York of approximately 442 students in grades K-12. The demographic of the school is predominately white (94%) with a small population of African-American and Hispanic students (4%). Over half of the population (54%) is classified as economically disadvantaged and 13% are eligible for free lunch.

The study takes place in a small-group environment where students meet in a spacious literacy room on their own, with minimal distractions. The group meets daily. Miss Call leads the group using the Leveled Literacy Intervention system by Fountas and Pinnell, which consists of students reading intriguing leveled books in their Zone of Proximal Development. It was Vygotsky who composed the term “Zone of Proximal Development,” which references the conditions in which a student is best able to learn at a challenging level due to a teacher that is providing the right amount of support. These books are introduced using a thorough book orientation that prepares students for any difficult words or plots so they are set for success. Each book has a reading record sheet that can be printed for the book. Every lesson consists of reading a book and discussing the book, along with other components like word work and writing about reading. The small group meets for forty minutes each session before each student returns back to his or her respective classroom.

### **Researcher’s Positionality**

My role in the study is as a researcher and observer. Throughout the time of data collection, I had the privilege to study literacy while working in a myriad of classrooms as a per-diem substitute at this rural school. I am also a graduate of this rural school, and I live in the town where this research was conducted. I am interested to study students who have grown up in the same school setting as myself. Because my participants and I share a similar background, it gave me a personalized perspective of what these children were experiencing in their daily school activities. Additionally, my background as a student in the B-12 literacy program at Brockport College gave me a constructivist perspective that I routinely referenced throughout the course of this study.

## **Data Collection**

This research study was designed to be qualitative; thus, data collection was in the form of observations, interviews, and audio recordings.

### **Interviews**

I used three interviews with students: pre-RMA, during-RMA, and post-RMA to get an idea of their feelings toward the process of reading and what students think of the teacher asking them about their miscues. Also, I interviewed the literacy specialist to ask her opinions about how RMA is affecting her students, if she likes the process, and how it could be made better. The teacher was interviewed pre-RMA and post-RMA.

### **Audio Recordings**

Mostly, I used audio recording to get authentic dialogue of conversation between the literacy specialist and a student during RMA. Audio recordings were used to capture student conversation on their comprehension of the book once they finish reading it. I did not record every conversation, but I recorded comprehension conversations once a week to see if RMA is helping lead to better conversational skills and deeper understanding of the text. Furthermore, I collected copies of the students' reading records so that I could analyze any patterns of miscues to see if there is evidence of students integrating the three cueing systems (Does it make sense-meaning? Does it sound right- Structural? Does it look right-graphophonic?). I expected students to use information from each of the three-cueing systems as they became increasingly aware of their reading strategies. Overall, I scanned all sets of data to look for the use of metacognition.

### **Observation & Data Analysis**

Interviews were analyzed for change of attitude and thinking. Did students exhibit language and attitudes that indicate their level of metacognitive awareness is increasing?

Increasing metacognitive awareness is linked to having a growth mindset, because students who think metacognitively are in control of their own thinking (Y. Goodman, 2001). Thus, statements like “I can’t, I won’t,” “mistakes are bad” generally transform into statements like, “I can try” “It’s ok to make mistakes” “We help each other” as children learn that they have control over the flexibility of the strategies they can employ to help them better understand a text or problem.

The teacher interviews were analyzed to determine her overall intuitive observations of her students’ metacognitive awareness and her personal feelings toward RMA’s ability to nurture metacognitive awareness. Specifically, I analyzed her interviews with the following questions in mind: Does she feel her students have a growth mindset? Does this change throughout the process? How comfortable does she feel with her students’ metacognitive awareness at the beginning and end of the study?

Audio Recordings were monitored for indications of metacognitive awareness. Indications of metacognitive awareness can be difficult to notice; however, according to Veenman et. al. (2005) metacognition can be observed in students’ speech, such as “this is difficult for me” or “let’s do it step-by-step” or “wait, I don’t know what this word means.” .

The audio recordings of book talks (comprehension) were analyzed in hopes of noticing metacognitive awareness speech as each student discussed his or her astute wonderings and understanding of the book. Reading records were analyzed for patterns of miscues so that I could perhaps determine if students’ metacognition of strategies allows them to fuse the three miscues instead of relying on one or two.

## **Procedures**

The procedures for this study were modeled after the landmark “Comprehension Fostering and Comprehension Monitoring,” research study, which was completed by Palinscar

and Brown in 1984. This study shaped the discussion of metacognitive instruction for the academic community. In their study, Palinscar and Brown trained teachers how they would utilize reciprocal teaching (teacher and students taking turns to lead an comprehension-fostering discussion) to further their students' understanding of four metacognitive domains: summarizing, questioning, clarifying, and predicting.

In my study, I met with the literacy specialist before the RMA teaching and discussions to discuss the research purpose and design in full. In this training we reviewed the definition of metacognition and its relevance and presence in the minds of young children. Also, we discussed the purpose and procedure of our RMA sessions, including how we modified RMA to be developmentally appropriate for young elementary students. Above all, it was important that the RMA sessions did not become centered on teaching metacognitive strategies. Fountas and Pinnell (2006) warn that teaching a strategy by just "telling" the student about the strategy will just confuse a child. They instead recommended modeling, shared demonstrations centered on the text, and allowing time for students to talk about how the strategy helps them comprehend the book they are currently reading. In order to follow best practices, the RMA session with the students followed a similar pattern: students did not discuss more than four miscues, and the discussion refrained from turning into abstract talk about a strategy and instead focused on a better understanding of the book the group is reading.

After the necessary training, we met with the students for the first day of the study. The literacy specialist introduced me to the students on first day so that students were not so distracted by the meaning of my presence that they neglected to focus on comprehension of the text.

We utilized the format and books from the Leveled Literacy Intervention program designed by Fountas and Pinnell, and thus used the exact LLI format in that students are able to read on their own and come back to discuss during their LLI sessions for this study. In order to fit in RMA sessions into the LLI format, we utilize the literacy teacher's procedure of having one "star reader" student read part of the book aloud so that the literacy teacher can conduct a reading record while the student is reading. Once the student has finished reading the small reading record excerpt (80 words), we stop to conduct the RMA session.

For the first time RMA session, I was the model student, and the literacy specialist played the part of the teacher. The students watched and listened as Miss Call took notes while I read aloud (and make purposeful mistakes). Then, she led me through the short RMA session:

Miss Call: "Angela, I made a note here that you said, "kitty" instead of "cat." Find this on page 2, read that sentence again... why do you think you said that?"

Ms. Larmon "hmmm." I'm not sure... what was I thinking... let me think a moment. I think my brain was thinking that the picture had some kind of a small cat in it, so I said "kitty." I always call cats, kitties.

Miss Call: "Ohh!" Well, that was a good mistake to make, because kitty and cat mean the same thing. So, even though you made a mistake, you still understood the story. Now, let's look at these two words. [Writes kitty and cat on whiteboard]. What's the difference between the letters in these two words?"



Ms. Larmon: Wow. They are really different... they don't look the same at all! One starts with a K and the other starts with a C. And the endings look very different too! One has two "t's" and a y, but "cat" has only three letters. And it ends with "t."

Literacy Specialist: Very good! There are many differences! So, I know that word made sense in the story, but [erases 'kitty] does "kiiittttyy" [slides finger under cat as she says this] look like that word? Does it look right?

Ms. Larmon: Whoa, definitely not. So that's what you mean when you say, "does it look right?" You mean the word I say has to look like the word on the page?

Miss Call: Yes! That is exactly what I mean. But, it is also important that the word make sense. In this example, "kitty" and "cat" are both words for this (points to picture of cat) animal.

After this we discussed how everyone makes mistakes when they're reading- even adults! By looking at our mistakes we can get an idea of how our brain thinks, so we can become better readers and better thinkers.

Every time the group met one student read a part of the book that the students have already read. This follows the LLI setup and it reduced anxiety. These sessions happened twice a week and are always recorded. The RMA discussions were a conversation between the student and the teacher. Because there were only three students in the small group, each student was RMA participant every time we meet while the others listen worked on writing about reading at another table. Afterward, the students moved on to the book talk as usual in

LLI, though the teacher sometimes made references back to RMA where appropriate. After the first couple of sessions, I pulled students aside after the RMA time to interview the students. I also interviewed students several weeks into the study and at the end. The literacy specialist was interviewed at the beginning and end of the study.

**Criteria for Trustworthiness:**

I have conducted a qualitative study using research-based practice to ensure my research design was appropriate for the age level I worked with throughout the course of this study. To ensure my study was safe and ethical, the Institutional Review Board at SUNY Brockport reviewed and approved my proposal. To ensure I had an open mindset, I made sure to record unbiased observations that were double-checked by graduate school colleagues and included three student surveys so as to ensure triangulation of data (Clark & Creswell, 2015). In order to make sure my research design was valid, I ensured a prolonged study with a consistent environment and literary teacher. Due to the fact that this is a qualitative study, exact replication is impossible, but a similar study could be conducted.

### **Analysis**

In order to interpret and analyze my data I used a coding process that allowed for three emerging themes to arise. To begin, I analyzed each group of surveys (pre, midst, and post), and as I collected them, I notated any similarities or consistent differences between students' answers. I repeated this process every time a survey was given throughout the study. In regards to the RMA sessions, each discussion was transcribed verbatim, and I used constant comparative analysis to explore themes and anomalies that arose from the data (Clark & Creswell, 2015). In addition to general data exploration, I also looked for specific trends in the data that included the use of metacognitive phrases such as "I think I said that...", "I understand this because..." , "I don't understand..." , "My brain/mind did that because..." , "I don't know why my brain/mind..." and "Sometimes my brain/mind..." By taking note of the use and frequency that these phrases were used in RMA discussions, I was able to garner a better understanding of the presence and development of the metacognitive awareness my participants experienced throughout the study.

In order to assure emerging trends would be accurate, I triangulated my data from three sources— using student surveys, teacher surveys, and RMA transcripts to formulate patterns. By crosschecking data points across these sources I was able to discover three findings that provided an answer to my research questions: What happens when we introduce RMA in small group instruction for early elementary students? How will students use their learning about metacognition in their reading process? And, in what ways do RMA sessions lead to better conversational skills between students?

**Finding One: Students Began to Use Metacognitive Phrases During RMA**

The first trend I became aware of is that the student participants' language began to include certain phrases that have been deemed by Veenman (2006) to be reflective of metacognitive thinking. According to Veenman, "metacognition can be observed in students' verbalized self-instructions, such as 'this is difficult for me, let's do it step-by-step' or 'wait, I don't know what this word means'" (2006, p. 6). Therefore, I made sure to look for instances where students uttered certain metacognitive phrases during the conversation. The following phrases were chosen to be indicators of metacognition in this study because they specifically revolve around self-analysis and self-regulation of the mind, and therefore indicate metacognitive thinking is taking place: "I think I said that..." "I understand this because..." "I don't understand..." "My brain/mind did that because..." "I don't know why my brain/mind..." and "Sometimes my brain/mind..."

At the onset of the study, I modeled the use of metacognition by role-playing as a student while the literacy specialist assumed the role of the teacher. The script included multiple metacognitive phrases such as "I think my brain thought that...", "I'm not sure why I thought that", and "What was I thinking..." I had predicted that modeling metacognitive thinking via think-aloud discussions would encourage the students to do the same, but it took the students a long while before they consistently used metacognitive speech during RMA sessions.

Instead, the initial RMA sessions seemed to make the students especially self-conscious about their reading miscues, which was an undesired outcome. The last thing I wanted was to make these young readers feel bad about their capabilities. This could reinforce negative reading habits such as teacher dependency, inflexibility when sounding out words, and a negative perception of reading (Y. Goodman, Martens, Flurkey, 2014). During the first RMA session

worry twisted in my stomach as I watched Miles, one of my participants, slightly hunch his shoulders while I talked about one of his miscues—I wondered: What if RMA discussions were too pointed for young students to handle? What if talking about miscues places too much focus on mistakes, instead of comprehension and general enjoyment of the story? My mind flashed back to warnings given by Fountas and Pinnell (2006) that teaching can become “heavy-handed,” that is, teaching can become too focused on isolated components of reading (such as miscues) instead of keeping strategy lessons and miscue analysis centered on making meaning of the text.

I decided metacognitive discussion would have no chance to take place if the students felt stressed at the prospect of discussing miscues in the first place. To help put everyone at ease, I decided that it might be beneficial for me, as the researcher, to consistently model the act of analyzing miscues or mistakes. Therefore, all three discussions on the second day of research began with me asking students to listen while I read so that they could find my miscues. Then together the students and I discussed what my brain might have been thinking when I made the miscues. From there, I would instruct the student to turn to a place in the book where they had made multiple miscues, and I would read aloud what the student had read while the student followed along in the book. Once again, we would then discuss what his or her brain might have been thinking when he or she made the miscues.

By the fourth day of research, all of the student participants were not only more willing to discuss their miscues, but they also all used at least one metacognitive phrase during the discussion. Lily, another student participant, utilized two metacognitive phrases in her discussion of the non-fiction text, *All About the Sonoran Desert*, which is a Level J text in the Leveled Literacy Intervention (LLI) system designed by Fountas & Pinnell. The following is a section of the discussion that took place:

Ms. Larmon: All right, you did a good job talking about my reading miscues! Now, can you turn to page 7? I'm going to read to you exactly what you read, and you're going to see if you can spot your miscues, just like usual, ok?

Lily: Ok!

Ms. Larmon: (Reading Lily's version of page 7- words in parentheses are the words that were written on the page, underlined words are the words Lily substituted) "The cactus has very long spikes (spines). The spikes (spines) help shade the plant from the hot sun." Ok, Lily, did you find any mistakes?

Lily: I think so... this word? (Lily points to the word "spines")

Ms. Larmon: You're right! You have to believe in yourself- you've got it! Do you know what that word actually says?

Lily: (Quietly sounds out word) Speens? No- Oh- *spines!* I was like, speens? No. *Spines.* I think I said "speens" because I saw the "i" and the "e." I think sometimes my brain gets confused on what sound to say, you know? I think that [way] sometimes....

Lily's use of the phrases "I think I said..." and "I think sometimes my brain..." indicate that she is considering her own thought process when reviewing her reading miscues. According to Vygotsky, effective learning "necessitates conscious reflective control and deliberate mastery"

(As cited in Fisher, 1979, p. 2). By encouraging students to pause and internally inquire the choices their mind makes while reading, RMA discussions necessitate conscious metacognitive reflection.

The following chart demonstrates the progression of metacognitive phrases used throughout the course of the study:

**Table 1**

Student Participants	<i>Number of Metacognitive Phrases Used During Each RMA Discussion</i>									
	<u>Week of Study</u>									
	1	2	3	4	5	6	7	8	9	10
Lily	1	1	2	2	3	-	3	3	3	2
Miles	0	0	0	1	-	-	1	-	1	2
Haley	0	1	1	2	2	3	3	-	-	2

Table 1: Indicates the number of times a metacognitive phrase was used during an RMA discussion. Dashes represent a student’s absence on the day of study.

**Finding Two: Students Developed Growth Mindset Regarding Miscue Analysis**

At the beginning of the study, all of the student participants were reluctant to talk about their reading miscues. While pre-survey responses for the study indicated that all participants believed good readers can make mistakes, there seemed to be a disconnect from this notion when students were encouraged to talk about their own reading miscues, or mistakes. During the first

three days of meetings with students for RMA sessions, the average length of each discussion was about two minutes, with the average student speaking for only fifteen seconds of that time.

Being uncomfortable with one's mistakes (and viewing mistakes as indicators of failure) is associated with having what is called a "fixed mindset" (Aditomo, 2015). The opposite of a fixed mindset is "growth mindset," and it is this type of mindset that fuels metacognitive awareness and health (Aditomo, 2015). Having a growth mindset places students in a position to pursue new knowledge and skills without being concerned about appearing unintelligent should they make a mistake (Aditomo, 2015). Being unafraid of temporary setbacks while learning is associated with metacognitive awareness—Sternberg and Davidson (1983) postulated that one of the standout characteristics of metacognitive awareness is that students who possessed it were aware of what their mind could and could not do, and they also knew what strategies could help them gain the knowledge that would help lead them to further understanding.

Throughout the course of the study, the students became more receptive toward talking about their miscues during RMA sessions. While the average RMA discussion remained about the same length (~4 minutes), the ratio of teacher verses student talk during the conversation changed considerably. The average student talked for 65 seconds throughout weeks 4-6. Student survey answers also indicated that students were more comfortable talking about their miscues. All three participants answered positively when asked whether or not they liked talking about their mistakes/miscues during RMA discussions during the "midst" survey, which was taken during week three:



**Table 2**

<i>Student Participants' Response Indicating Growth Mindset</i>
<u>Question 4: Do you like talking about your reading mistakes in our reading group? Why?</u>
<b>Lily:</b> Yes, I like it... But I don't make many mistakes, so it's good.
<b>Miles:</b> It's all right. I like finding them, sometimes.
<b>Haley:</b> Yeah, it's good. Even you make them. I like finding them when you make them.

Table 2: Indicates each participant's response for the fourth question on the midst survey- the survey conducted during the middle of the study.

Additionally, the teacher participant data supported the finding that the students were developing a growth mindset that enabled them to better confront their miscues. In Miss Call's answer to question two on the "post" survey (How do you feel your students are reacting to RMA sessions?) Ms. Call answered that the students "[Are] responding positively- they seem to not mind talking about their miscues as much as they did in the beginning, and they are alright talking about their miscues during regular class time too." Ms. Call's response to this survey question is particularly noteworthy because, in addition to confirming the students' development of growth mindset, she seems to note that there is a transfer of skills from RMA discussions to regular classroom discussion. Palinscar and Brown explored the idea that explicit metacognitive teaching can lead to better "transfer of knowledge across conceptual domains" (1983, p. 22). The teacher participant's report that students were able to speak openly about their reading miscues outside of the research study aligns with Palinscar and Brown's findings concerning the

correlations between explicit metacognitive instruction and the growth mindset that enables transfer retention.

### **Finding Three: Teacher Modeling Encouraged Metacognitive Discussion**

The age of the student participants for this study was seven to eight years old, and all three participants were in second grade at the time of this study. This is much younger than the age of most students who participate in RMA sessions. When Ken Goodman first developed Retrospective Miscue Analysis in 1969, it was to service middle school and high school students who had experienced difficulty in literacy since they had been young children (Y. Goodman, Martens, Flurkey, 2014). Though there are cases of RMA being instituted in classrooms as young as third grade (Y. Goodman, Martens, Flurkey, 2014), both RMA pedagogical books focus primarily on students in the middle and high school levels (Y. Goodman, Martens, Flurkey, 2014 & Goodman, Y.M., 1996).

Though the student participants for this study were much younger than the students RMA was originally designed to assist, small changes to the discussion format allowed the younger participants of this study to utilize and benefit from RMA. For instance, after observing how uncomfortable all three young students became when I immediately began talking about their miscues, I made small changes in my approach to the RMA discussions. At the start of the second RMA meeting, I began with a book discussion as an opener—asking each student what they liked and disliked about the about the book they had just read. After this, I asked the student to turn to a page in the book where I would ask them to follow along while I read so they could find my reading miscues. All of this was done before I instructed the student to turn to a page and follow along while I read aloud the student’s miscues as they followed along in the book.

My rationale for modifying RMA sessions in this way is derived from the cognitive apprenticeship model, which was recognized and coined by David Wood in 1998. In an apprenticeship model, a teacher uses Vygotsky's Zone of Proximate Development theory to provide the perfect amount of support for a child- support that is neither too intrusive nor too fleeting (Johnson & Keier, 2010). In the case of the three student participants, I used modeling (a technique utilized frequently in the apprenticeship model) to provide sufficient cognitive and emotional support for the student participants to feel comfortable enough to discuss their miscues with me, the researcher. Thus, even though the student participants were much younger than typical RMA session students, they were able to candidly participate in the direct discussion RMA sessions require of struggling readers.

### Discussion

My data led me to several conclusions that have significant impact on early childhood instruction. First, the data showed that students' language began to include phrases that were indicative of metacognitive awareness. The student discussion transcripts displayed an increased use of metacognitive phrases such as "I think my brain..." Palinscar and Brown (1984) mention that metacognitive phrases such as the one stated above are indications of the metacognitive processing that is occurring in students' minds. Thus, the first data finding of this study relates to the findings of Wren (2002) and Gough and Hillinger (1980): direct instruction that targets development of metacognitive awareness is necessary in order for students to develop higher-order metacognitive thinking skills.

The second data finding of this study was that students were developing a growth mindset regarding miscues through RMA discussions. This finding was realized through studying the length of student contributions during RMA discussions throughout the course of the research study. Though students were reluctant to talk about their miscues in the first few RMA sessions, the data showed that by the end of the study students were participating much more in the discussions. Being unwilling to talk about one's mistakes is considered having a fixed mindset, while accepting mistakes as opportunities to learn is considered a growth mindset (Aditomo, 2015).

Although students in this study were much younger than typical RMA participants, the development of growth mindset mirrors the results that Goodman (1996) stated came from RMA sessions with older students. According to Goodman (1996, p. 15), as students continued to participate in RMA sessions, they become more willing to use "keep growing" strategies because

they began to realize mistakes can be a means of furthering understanding—this is the essence of growth mindset (Aditomo, 2015).

Lastly, this study found that teacher modeling can be used to encourage metacognitive discussion. This finding was discovered through careful observation of student reactions, and then through subsequent responsive teaching. Initially, students seemed uncomfortable in their role as an active participant who discusses their own thinking. However, after I, the researcher, modeled discussing my own mistakes, the students seemed to gain confidence and proficiency in their role as a student who uses metacognition to analyze his or her reading miscues. Palinscar and Brown (1984) and Johnson (2010) state that teacher modeling can encourage student metacognition and general performance on academic tasks.

## **Conclusions**

The findings of this study yielded three conclusions: 1) RMA leads students to become reflective readers through metacognition, 2) Metacognitive awareness can be effectively taught to young students using RMA, and 3) Metacognitive instruction nurtures a growth mindset. Each of these conclusions was logically deduced from each finding by analyzing what the data and subsequent finding meant overall.

## **RMA Leads Students to Become Reflective Readers Through Metacognition**

Throughout the course of this study, student participants demonstrated a growing metacognitive awareness that allowed them to become active readers who thoughtfully reflected on how they made meaning of text. As students became more comfortable with discussing their miscues during RMA discussions, longer and more meaningful conversations could be generated about each student's unique reading thought-process. Additionally, the teacher participant survey suggested that students were utilizing the self-reflective metacognitive discussion techniques

they had learned in RMA sessions during regular classroom conversation when asked to discuss their understanding of a text. RMA discussions are reciprocal to metacognitive awareness because these discussions require students to reflect upon their thinking, and this will lead to the realization that their reading is impacted by “their knowledge of the world, its languages, and what they believe about reading and their level of metacognitive awareness” (Y. Goodman, 1996, p. 15)

### **Metacognitive Awareness Can Be Taught to Young Students Using RMA**

RMA has been effectively used to help upper elementary and secondary students “revalue” themselves as readers through developing students’ metacognitive awareness (Y. Goodman, Martens, Flurkey, 2014). The students in this study were much younger than the typical students who utilize RMA, but these young students were able to develop metacognitive awareness as well. This was evidenced by the data indicating a pattern of metacognitive phrases used by the student participants in RMA discussions and by the progressive length of RMA discussion over time. By leading the students through modeling techniques, I enabled students to participate as self-reflective thinkers during RMA discussions. There is little doubt that teacher modeling is an effective teaching technique than can access a student’s Zone of Proximal Development (Palinscar & Brown, 1984 & Johnson, 2010). However, the findings of this study indicate that when scaffolding techniques such as modeling are combined with student-centered discussions like RMA, even young students can develop metacognitive awareness through RMA discussions.

### **Metacognitive Instruction Nurtures a Growth Mindset**

At the beginning of the study, the student participants had a fixed mindset toward their reading miscues—they were reluctant to discuss their miscues and seemed uncomfortable having a discussion in which their miscues were the main topic. However, as the study

progressed, teacher modeling was used to demonstrate that even adults can learn from their mistakes. This encouraged students to view their miscues as indicators of misconceptions instead of failure. As time progressed so did students' use of metacognitive phrases and willingness to talk about their mistakes during RMA discussions. Thus, the data conveyed evidence that as students' metacognitive awareness developed so did their growth mindset. This conclusion echoes past research that found metacognition is interconnected with having a growth mindset as metacognitive awareness enables students to recognize their mistakes and identify why they made them. (Goodman, Y.M., 1996; Sternberg, 1980; Palinscar & Brown, 1984).

### **Implications**

#### **RMA Should Be Used to Teach Metacognition and Promote Active Reading**

This research study has concluded that RMA discussion sessions were able to enhance early elementary students' metacognitive awareness and growth mindset. As metacognition and growth mindset enable a student to monitor their reading process (Goodman, Y.M, 1996; Sternberg, 1980; Palinscar & Brown, 1984), it is logical that RMA discussions should be used in the classroom to teach metacognition and promote active (reflective) reading. The findings of this study indicate that if teachers model metacognitive thinking throughout RMA discussions students will begin to develop the growth mindset necessary to engage metacognition and become active readers. Thus, teachers who use RMA discussions will help all students develop metacognition, but they will especially help struggling readers who are unaware of the strategic metacognitive thinking that will enhance self-monitoring and comprehension of the text (Wray and Lewis, 1997).

### **Teachers Should Learn How to Target Metacognitive Development**

Children do not develop the metacognitive strategies needed to comprehend high school and college level texts on their own, they must be taught to use metacognition through direct instruction (Wren, 2002; Gough & Hillinger, 1980). This researched notion is validated by the findings of this study. Throughout the course of the RMA discussions student participants utilized more metacognitive language phrases and were more willing to engage in thoughtful discussion of their reading miscues. Therefore, it is important that teachers are informed of ways to teach students about the metacognitive process so that students can develop metacognitive awareness. This study has found that RMA is successful in cultivating metacognitive awareness through text-centered discussions; thus, teachers should receive professional development reinforcing the benefits of using RMA to teach metacognition along with the latest research that has been done on metacognition.

### **Limitations**

As is the case with any study, my research experienced limitations. First, due to school scheduling and student homogenous grouping, the population of my study was very small—involving only three students. This means some of my findings may not transfer to a larger population. Secondly, the length of my study was relatively short—data was collected over a span of five weeks due to the dynamic nature of student grouping in the participating school district's RTI program.

### **Recommendations for Further Research**

Though research into metacognition and metacognitive awareness has exploded since Palinscar and Brown's 1984 study, there is still much we do not know about how to implement metacognitive techniques consistently and effectively in the classroom. Instruction in



metacognitive theory and practical classroom activities that promote metacognition are desperately needed, as many teachers acknowledge being unsure of how to nurture their students' metacognitive awareness (Veenman, Kok, and Kuilenburg, 2001). Thus, in addition to exploring metacognitive teaching techniques in literacy, it would be beneficial for further research to analyze how the components of RMA that enhance metacognition and growth mindset in literacy can be utilized in mathematics to build numeracy

The conclusions of this study highlight the importance of using explicit metacognitive instruction for teaching elementary students. Many researchers link metacognition to effective memory skills, knowledge of reading and mathematical strategies, and a confident outlook (Ferguson, 1980; Sternberg, 1983; Palinscar & Brown, 1984). Therefore, it is logical for teachers to use RMA to nurture metacognition in young children so that all students may have the chance to take ownership of their thinking and obtain academic success.

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## Appendices

### Appendix A

#### Retrospective Miscue Analysis Interview Questions (Pre)

1. When you are reading and you come to something you do not know, what do you do?

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2. Do you ever do anything else?

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3. Who is a good reader that you know?

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4. Do you think (insert good reader from question 3) ever comes to a word they don't know?

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5. What do you think this good reader does when they are stuck on a word they don't know?

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**Appendix B**Retrospective Miscue Analysis Interview (Midst)

1. When you're reading and you come to something you don't know, what do you do?

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2. How do you know that you have read a word wrong when you are reading?

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3. How do you feel when you make a mistake/miscue when you are reading?

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4. Do you like talking about your mistakes/miscues after you are done reading?

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5. Do you think that talking about your reading mistakes/miscues helps you be a better reader? Explain yes or no.

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**Appendix C**

Retrospective Miscue Analysis Interview (Post)

1. When you're reading and you come to something you don't know, what do you do?

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2. How do you know that you have read a word wrong when you are reading?

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3. How do you feel when you make a mistake/miscue when you are reading?

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4. Do you like talking about your mistakes/miscues after you are done reading?

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5. Do you think that talking about your reading mistakes/miscues helps you be a better reader? Explain yes or no.

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**Appendix D**

Teacher Participant Retrospective Miscue Analysis Interview (Pre)

1) How do you feel about your students' progress in literacy acquisition?

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2) Is there any aspect of literacy acquisition that you feel you are especially gifted in teaching?

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3) Is there any aspect of literacy acquisition that you feel you struggle when teaching literacy?

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4) Have you ever focused on your students' metacognitive acquisition, and if so, what activities or teaching prompts have you made?

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**Appendix E**

Teacher Participant Retrospective Miscue Analysis Interview (Post)

1) Overall, how do you feel your students' literacy acquisition was affected by RMA sessions?

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2) What would you say is the biggest benefit to RMA sessions? Are there any negative attributes?

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3) Do you think that RMA sessions have affected your students' metacognitive awareness? If so, can you recall any specific examples?

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4) What changes would you make to RMA sessions to ensure they are more effective in helping your students?

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