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The Use of Reading Strategy Prompts in Math

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by

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Abstract

This qualitative study explores the use of the three main reading strategy prompts from the cueing system in small group math instruction. It discusses the need for teachers in the secondary school setting to be knowledgeable about the reading process so that they can help struggling readers. The study seeks to offer a method for teachers of all content areas to begin supporting readers. One-on-one interviews were conducted to determine the participants' current use of reading strategies prior to and at the conclusion of five mini-lessons, in which the researcher implemented the use of three reading strategy prompts: Does that look right? Does it sound right? Does that make sense?

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Introduction

"My students are reading the assigned chapters, but do not understand what they are reading. How am I supposed to teach the content when the students do not comprehend the text? I'm not the reading teacher!"

Problem Statement

There is a large population of middle and high school students not on reading level. With each passing year the work gets more challenging and these students fall further behind. In 2003 there were eight million students between 4th and 12th grade not on reading level (National Center for Educational Statistics, 2003). In the middle and high school grades, instruction becomes more content specific and students have different teachers for different subjects. As the instruction shifts in these grades, teachers are left wondering what they can do to help students who struggle with reading learn the content. Given that many students are entering the secondary school setting struggling to read on grade level, it is important for all content teachers in these settings to be knowledgeable about the reading strategies that reading teachers use to scaffold student strategy use (Clay, 1991).

Rationale

As an English Language Arts teacher in a middle school, I regularly overhear teacher conversations about the stresses of teaching students who struggle to read in their content areas. Not all teachers are considered reading teachers, but all content areas involve reading. The reading process is complex and requires the ability to use various reading strategies simultaneously. Less able readers need supplementary support in building their reading processes. This study looks to see if reading strategy

prompts usually used in the ELA classroom can be used in mathematics to aid the development of students' reading process.

During literacy instruction, knowledge is facilitated by the teacher, who transfers the control of reading strategies to the student (Wozniak, 1980). Therefore, to meet the challenge of all students reading on grade level, there is a need for all teachers to be knowledgeable about the reading process and effective literacy practices across content areas. In the secondary school setting, teachers are trained as content specialists and do not have the training needed to teach higher-level literacy skills (Richardson et al., 2006). The gap between students' skills and content area teachers' reading pedagogy is too great to be addressed by rigorous standards and curriculum alone. Therefore, this study is necessary because it may offer teachers in these settings a simple and easy way to support students by using specific reading strategies.

Purpose of the Study

The purpose of this qualitative study is to analyze what happens when teachers use reading strategy prompts in mathematics. The study derives from research that considers teacher language an effective support in the classroom (Ankrum, 2013; Holdaway, 1979; Lee & Schmitt, 2014; Lyons, 2004; and Maloch, 2002) and from questions used to help students in building their reading process. Essentially, this study explores teacher language use in small group mathematics instruction to determine if reading strategy prompts can be implemented in a content area other than reading. The findings allow me to collaborate with teachers in the secondary school setting through professional development workshops and to develop instruction that helps struggling readers in all subjects.

Research Question

The research question of this capstone project is: What happens when teachers use reading strategy prompts in math instruction?

Literature Review

Introduction

Students entering the secondary school setting can struggle in reading if they have not yet refined their reading process. Research in the field has previously focused on best practices in teaching students to independently use reading strategies in reading instruction. The research identifies verbal scaffolding as an effective instruction technique used to cultivate the independent use of reading strategies. There has also been research on ways to implement literacy instruction in mathematics. What is lacking in the research is the use of reading strategy prompts in other content areas.

The Reading Process

As defined by Weaver (2009) the reading process is determined by what the reader brings to the reading: the prior knowledge, experiences, and strategies for processing text. The strategies one uses vary according to one's purpose for reading. The reading process involves the mind actively processing the text, and the social factors that affect how one reads the text. Therefore, "reading is both a brain-to-text and text-to-brain process" (Weaver, 2009, p. xiii).

There are three main sources of information (meaning, structure, and visual, or MSV), which require the reader to simultaneously use strategic actions in order to make meaning of text. These sources of information are referred to as the cueing system. The literacy needs of adolescent readers vary according to the sources of information used and not used (Hervey, 2013). According to Clay (1991), teachers can identify what

sources a reader uses by observing and recording their oral reading behaviors. One process teachers use to identify and analyze a student's reading behavior is known as a Running Record. It is through this process that teachers observe overt behaviors and make inferences about a reader's strategic processing. The behaviors connect to the three sources of the cueing system. The sources of information not being used by the reader are noted, and strategy prompts are implemented during instruction to encourage their use (Clay, 1991). The term *strategy prompts* refers to specific questions asked by the teacher in order to encourage a reader to perform a strategic action with a text to build comprehension. Specifically, a teacher may prompt a reader to check for meaning by asking: Does it make sense? To focus a reader's attention on structure the teacher will prompt with: Does it sound right? Finally, to encourage a reader to use visual information provided in a text, the teacher will ask: Does it look right?

This study takes the three main prompts of the cueing system (Does it make sense? Does it sound right? Does it look right?) and implements them in small group mathematics instruction to see if they can be successfully transferred to another content area. The use of these prompts is important for all teachers because they allow teachers of all content areas to support readers in building their thinking process as they continue to learn about the reading process.

Scaffolding

Clark and Graves (2004) discuss scaffolding techniques that can be used by teachers to improve reading comprehension. It is their "hope to help teachers construct a deeper understanding of scaffolding, use it more frequently in their classrooms, and thereby improve students' comprehension" (p. 570). Scaffolding is the term used for the type of assistance given by a teacher to support a student in carrying out a task they are

unable to undertake independently. Scaffolds can extend a student's current skill base and knowledge to a higher level. It is believed that this idea of scaffolding is the instructional strategy Vygotsky (1978) referred to, when he described the zone of proximal development (ZPD). According to Vygotsky, a student's ZPD is the gap between what a student can do independently and what he or she can do with the assistance of a teacher. With practice and repeated experiences, the student internalizes the strategic action triggered by the scaffold, which allows the student to become independent in using the strategy to complete future tasks (Clark & Graves, 2004). There are different levels of support depending on the ability of the learner. The more complex the task, the more support the learner will need to accomplish it (Clark & Graves, 2004). This study seeks to use the reading strategy prompts of the cueing system to scaffold students' reading behaviors, which will allow teachers of other content areas to implement the prompts into their instruction.

Verbal Scaffolds

One of the most influential scaffolds is the use of language, also known as *verbal scaffolding*. Holdaway (1979) described how teachers teach strategy through their use of language, which induces the learners to perform and confirm their own responses. More specifically, Maloch (2002) said that effectively scaffolding students through questioning and prompting can provide the developmentally appropriate support that young learners need to think on a higher level. Furthermore, Lyons (2004) claimed that language enables teachers to promote thinking by structuring their dialogue in a way that provides learners with multiple opportunities to construct new and more complex understandings.

In a recent qualitative study, Lee and Schmitt (2014) found that teacher language was critical to the successful development of strategic actions in reading. This study looked at children participating in a Reading Recovery program, which involves intensive one-on-one intervention for first grade students struggling to read (Clay, 1993, 2005). In this study teachers trained in the program used several measures to look at the students' knowledge of reading strategies. An interview was performed prior to, and at the end of fifteen lessons. The lessons provided the teacher with opportunities to use language to introduce a book and scaffold and model the use of reading strategies. As the teacher relinquished control to the student, a Running Record was performed to capture the student's oral reading behaviors, which allowed teachers to make inferences about the strategies the students were using and analyze whether language influenced student behavior.

Audio recordings were used to capture teacher language during instruction and student language during independent reading of the text. Lee and Schmitt (2014) mapped, analyzed, and compared teacher language with the behaviors exhibited by the students. They then graphically displayed the results to describe the relationship between teacher language and student reading behaviors. The behaviors included taking words apart, rereading, self-monitoring, searching for information, and problem solving.

What Lee and Schmitt (2014) found was that initially students did not engage in taking words apart at the start of the lessons. Then gradually the students began demonstrating this behavior in their independent reading. The same results followed in the analysis of the other reading behaviors, showing a correlation between teacher language and student reading behavior. In conclusion, the teacher's language decreased

as the students took control of the work and became independent users of the reading strategies (Lee & Schmitt, 2014).

In another study, Ankrum et al. (2013) provide examples of effective verbal scaffolding in small group reading instruction in order to describe the kinds of differentiated scaffolds expert teachers use to meet the needs of beginning readers. For instance, Ankrum et al. (2013) explain the explicit nature of one of the teacher's verbal scaffolds during small group reading instruction. They found that the teacher explicitly explained and modeled specific reading strategies in order to coach students on how to decode and comprehend texts. The authors shared transcripts to illustrate the various types of verbal scaffolds provided to beginning readers. Each lesson varied according to the needs of the students, indicating the importance for teachers to be responsive.

The transcripts showed that with the use of language, the teacher was able to access the prior knowledge of her students, encourage participation, verify responses, introduce strategies, and praise student attempts. Depending on the student, the scaffolds ranged from least supportive to most supportive. This study implies that if teachers make their thought processes visible to students, students can better apply strategies to their own reading (Ankrum et al., 2013).

Similar to these studies, my study looks to use language to prompt student strategy use in math in an attempt to begin helping teachers in the secondary school setting aid the development of student reading processes. However, I only use the three main prompts of the cueing system to provide content area teachers with a method to begin incorporating literacy instruction in their own classrooms.

Literacy in Mathematics

Phillips, Bardsley, Bach, and Gibb-Brown (2009) present a professional development project created to help middle school mathematics teachers and literacy coaches explore ways to integrate math and literacy skills and strategies. What they found was that the professional development gave teachers a deeper understanding on how they can support each other in meeting student needs. The authors suggest methods such as incorporating a think-aloud to help students think through a problem or process, the use of graphic organizers, using roots to determine unfamiliar words, and providing activities in small groups to allow students to practice skills and strategies. Through their work sessions, teachers realized they could use their content to teach reading skills, and that students need assistance in making connections to transfer these skills and strategies to other content areas (Phillips, Bardsley, Bach, and Gibb-Brown, 2009).

Nichols, Rickelman, Young, and Rupley (2008) sought to identify the strategies used by teachers of different content subjects in middle school and the effect professional development would have on teacher's use of literacy strategies in daily instruction. They looked at what instructional strategies were already being used by middle school teachers and then determined whether the strategies varied according to subject. They felt that "professional development…that focused on a variety of instructional strategies had the potential to make an immediate impact upon teachers' practices" (p. 223). Teachers participated in a survey to analyze the strategies with which they were familiar and were required to keep a monthly checklist on the strategies they used. Researchers observed lessons in order to check the reliability of the checklists.

What they discovered was that many of the strategies represented in the survey were never or rarely in the teachers' instruction. The cross-checking of the teachers' checklists with those of the observers reportedly matched up. Furthermore, some teachers used certain strategies frequently, while others used the same strategies less frequently. The study found that teachers tended to use strategies differently based on their content area. For example, English teachers used the writing process, free writes, and prewriting as their top strategies. The math teachers selected reciprocal teaching. Science teachers were the only ones to select concept maps and Venn diagrams, and social studies teachers used underlining and word walls. The researchers wanted to learn about the teachers' knowledge on strategy instruction in an attempt to develop necessary professional development that would facilitate effective use of reading strategy in instruction for all subjects (Nichols, Rickelman, Young, and Rupley, 2008).

Current research involving literacy instruction in mathematics seems to look at ways to provide professional development for teachers in the middle grades. My research study fills in the gaps in that it looks to identify simple questions that can be used by all teachers, in an attempt to impact a reader's reading process. At the same time, the verbal scaffolds in my research will introduce teachers of other content areas to sources of information that are imperative to a student's reading process.

Summary

There is a variety of research on scaffolding instruction to encourage the independent use of reading strategies. In addition, professional development workshops are being conducted to integrate mathematics and literacy skills in the secondary school setting. However, the gap in the research is whether reading strategy prompts are

effective in other content areas. A goal of this study is to find a way for teachers to best meet the needs of struggling learners in the middle and high school grades.

Methods

Introduction

The purpose of this capstone project originated from the research literature on the influence of verbal scaffolds in reading instruction. It also considered current practices of incorporating literacy instruction in mathematics to see what happens when teachers use reading strategy prompts in math.

Participants

The four participants in this study were chosen from a team of two 5th grade classes during the 2015-2016 school year. The school district is located in a small city in Western, New York, and is considered a Title I school. The term Title I signifies that the school receives federal funds for students at risk of failure and living at or near the poverty level. The majority of the students received free or reduced lunch. The participants were selected because they were below grade level in math and reading. The participants and their legal guardians signed consent forms to be a part of the study, indicating their willingness to partake in the research.

Setting

The instruction for this study took place afterschool in my classroom, two days a week. Students received small group instruction in mathematics using reading strategy prompts to elicit specific behaviors. The one-on-one interviews on the strategies students used to solve problems in math were conducted in my classroom as well. Only the researcher and participant being interviewed were present at the time.

My Positionality as the Researcher

I grew up in urban and suburban areas of Orange County, New York. I attended Buffalo State College (SUNY) for my undergraduate degree in Childhood Education (Grades 1-6). My experience in the teaching field includes one year teaching 1st grade and three years teaching 5th grade. I am currently working on my Master's degree in Literacy B-12 at SUNY Brockport. I believe literacy should be incorporated into all aspects of learning throughout the school day. I want to find ways to help teachers of other content areas help struggling learners use strategies that will allow them to independently monitor their thinking. In this study, I am the classroom teacher and participant observer.

Data Collection

Multiple sources were used to gather data on the use of reading strategy prompts in math instruction:

Interviews. I administered one-on-one interviews at the beginning and conclusion of the study to identify the strategies participants used to solve problems in math.

Audio Recordings. Like Ankrum et. al. (2013), I audio recorded all of the one-on-one interviews and transcribed them word for word.

Journals. At the end of each work session, participants reflected on the strategies they used to solve problems in math.

Field Notes. I took field notes to record the overt behaviors of the participants during each work session.

Procedures

Prior to instruction, I interviewed the participants one by one in an attempt to identify their current strategy use in solving problems in math. Following the completion of the one-on-one interviews, students participated in five small group mini-lessons in math. Each session began with a mini lesson on a mathematical concept, during which I used think alouds to incorporate the use of the reading strategy prompts. The think alouds allowed me to make my thought process visible to participants so they can better apply the strategy prompts on their own (Ankrum et al., 2013). I did not teach the reading strategy prompts explicitly, but strategically placed them in my teacher dialogue. After each mini lesson, students worked to independently solve problems and share their reasoning. Whenever students needed guidance, I used the prompts to encourage students to apply what they learned, scaffolding their thinking and strategic action. At the conclusion of each session, participants reflected on the strategies they used in a written reflection statement. After five work sessions I conducted an exit interview with each participant individually.

Trustworthiness

I used strategies outlined by Clark and Creswell (2014), to enhance the validity of this qualitative study. In addition, the use of multiple sources (interviews, audio-recordings, field notes, and journals) allowed for a triangulation of data.

Data Analysis

I used the process of open coding to analyze and interpret the data (Clark and Creswell, 2014). First, I transcribed the audio-recordings of the one-on-one interviews. Then, I highlighted similarities in the strategies the participants said they used regularly. Next, I went through the participants' written reflection statements, session

by session, and noted strategies participants said they used during the work sessions. Then, I recorded the strategies students were using in a chart and found themes that emerged. I also found evidence of similar themes in my field notes on the participants' behaviors over the five work sessions. My research involved a triangulation of my data which allowed for a more accurate response to the question: what happens when teachers use reading strategy prompts in math instruction?

Similar to Lee and Schmitt (2014), I used the constant comparison method as I reviewed the one-on-one interviews, field notes, and written reflection statements and identified themes. I categorized the themes across a chart by reading through the participant responses on the strategies they used over the course of the study. I used highlighters to color code evidence of each theme that emerged. Lastly, I reviewed the one-on-one exit interviews to capture changes in the strategies participants used from the beginning to the conclusion of the study. The results found in the figures supported observations described in my field notes. All methods of data collection supported each theme.

The purpose of my study was to analyze what happens when teachers use reading strategy prompts in math. I wanted to offer a way for content area teachers in the secondary school setting to support struggling learners by incorporating the use of reading strategy prompts in their instruction. I discovered themes within my findings by charting student strategy use over the course of the study. I found that participants' metacognitive awareness increased, and that the participants began to internalize the language of the reading strategy prompts.

Finding One: Participants' Metacognitive Awareness Increased

Strategic action became more content specific.

In analysis of the initial one-on-one interviews and the written reflections from the first two work sessions, participants solely used common math practices to describe the strategies they used to solve math word problems such as, “I added, I subtracted, I multiplied, and I divided.” I noticed this directly correlated with the overt behaviors in my field notes. In the first two sessions, participants worked quickly to simply solve for an answer. They did not stop to ask questions or look back over their work to check that it made sense, a strategic action provoked by asking, “Does it make sense?” (Clay, 1991).

By the third session, participants gained a more content specific awareness for the strategies they used. Instead of the typical “I added, I subtracted, I multiplied, and I divided,” participant 1 wrote, “I used a place value chart to understand the number.” Participant 2 wrote, “I used numbers, arrays, and place value charts,” and participant 3 wrote, “I was thinking if it was a tenth or a hundredth.” These written response statements indicated a shift from the simplistic strategy use of math practices to a more content specific application of strategies. Participants began making sense of the problems.

	Session 1	**Session 2**	**Session 3**
P1	I added, I multiplied, I divided, and I UNPACKed	I added, I multiplied, I divided, I asked: What do I do now?	I used a place value chart to understand the number.
P2	I UNPACKed	I added, I subtracted, I multiplied, I divided, I UNPACKed, I was thinking math how to solve the problem.	Brain, paper, checked to see if I made a mistake. I used numbers and place value charts also arrays.
P3	I added, I multiplied and UNPACKed, read it more than once.	I added, I subtracted, I multiplied, I divided, I was thinking what I would do to solve the problem.	I was thinking if it was a 10th or 100th and I had to look closely.

P4	I added, I multiplied, I UNPACKed	I added, I subtracted, I multiplied, I UNPACKed, I was thinking this stuff is hard and easy at the same time.	My brain and I multiplied, fractions, and I asked myself what you talking about?

Figure 1. Student thinking. This figure illustrates students beginning to think about content. UNPACK=Underline the question, circle the Numbers, Preview the information, solve for an Answer, and ChecK your work.

Also, evident in the participants' behaviors described in my field notes over sessions 3, 4, and 5, participants started to become self-directed by systematically checking their progress. I noted them applying metacognitive awareness by rereading the questions and stopping to look back at their own work to make revisions before asking for help and clarification. The language of the reading strategy prompts encouraged students to solve and confirm their own responses (Holdaway, 1979). As described by Wertsch (1985), language is an effective tool used to mediate the construction of meaning.

Questions became more content specific.

In analysis of the written reflection statements, participants began to include the questions they asked as part of their strategy use. At first, the questions seemed to be used to help guide them through the process of solving for an answer. In session 2, participant 1 asked herself, "What do I do now?" Participant 3 asked himself, "What would I do to solve the problem?" Then in session 3, participant 4 asked himself, "What you talking about?"

	Session 1	**Session 2**	**Session 3**
P1	I added, I multiplied, I divided, and I UNPACKed	I added, I multiplied, I divided, I asked: "What do I do now?"	I used a place value chart to understand the number.

P2	I UNPACKed	I added, I subtracted, I multiplied, I divided, I UNPACKed, I was thinking math how to solve the problem.	Brain, paper, checked to see if I made a mistake. I used numbers and place value charts also arrays.
P3	I added, I multiplied, and I UNPACKed, read it more than once.	I added, I subtracted, I multiplied, I divided, I was thinking what I would do to solve the problem.	I was thinking if I was a 10th or 100th and I had to look closely.
P4	I added, I subtracted, I UNPACKed	I added, I subtracted, I multiplied, I UNPACKed, I was thinking this stuff is hard and easy at the same time.	My brain and I multiplited, fractions, and I asked myself what you talking about?

Figure 2. *Asking questions. This figure illustrates students asking questions to help them solve for an answer. UNPACK=Underline the question, circle the Numbers, Preview the information, solve for an Answer, and CheckK your work.*

Later in sessions 4 and 5, participants began to ask themselves more content specific questions. For example, participant 1 asked herself, "Why did I add?" Participant 2 asked herself, "What if I looked at it without parentheses?" And participant 3 asked himself, "… if I had ones or hundredths." These questions indicate that students' thinking shifted away from the simple process of solving for an answer to higher level thinking specific to the content. Scaffolding students through questioning and prompting can provide the developmentally appropriate support that young learners need to think on a higher level (Maloch, 2002).

	Session 4	**Session 5**
P1	I subtracted, I added, I divided, I was thinking, which one should I use? Why did I add?	I counted by tens. I looked at the number.

P2	I subtracted, I added, I was thinking, this is an add problem. I asked myself what if I looked at it without parentheses?	numbers, place value chart, arrays, I was checking if I made a mistake.
P3	I subtracted, I added, I used PEMDAS, I was thinking bring down the parentheses, bring down the number.	numbers, arrays, if I had ones or hundredths? I checked if I had 7 rows and 3 tenths.
P4	I subtracted, I added, I divided, I used PEMDAS, I was thinking underline important stuff in the problem. I was looking for evidence to help my answer.	I was checking for after I did my work if it made sense or if it didn't make sense.

Figure 3. Content specific questions. This figure illustrates students asking content specific questions. UNPACK=Underline the question, circle the Numbers, Preview the information, solve for an Answer, and ChecK your work. PEMDAS= Parentheses, Exponents, Multiply, Divide, Add, Subtract.

Finding Two: Participants Began to Internalize the Language of the Reading Strategy Prompts

In the Initial one-one-one interviews and work sessions 1 and 2, participants showed no evidence of using the reading strategy prompts. By session 3, I began to see evidence that suggests their use in two of the four participants' written reflection statements. Participant 2 reported, "I was checking for if I made a mistake," and participant 3 wrote, "I had to look closely." In session 4, all participants recorded evidence of their use. Participant 1 wrote, "I looked at the number." Participant 2 wrote, "I checked to see if I made a mistake." Participant 3 wrote, "I checked if I had four rows and threes tenths." And participant 4 wrote, "…looked for evidence to help me solve." These reflections show students beginning to pay attention to the visual information in both the problem and their work. This relates directly to the prompt (Does it look right?) used by the researcher to encourage participants to use visual information provided in a text (Clay, 1991).

	Session 3	Session 4	Session 5
P1	I used a place value chart to understand the number.	I subtracted, I added, I divided, I was thinking, which one should I use? Why did I add?	I counted by tens. I looked at the number.
P2	Brain, paper, checked to see if I made a mistake. I used numbers and place value charts also arrays.	I subtracted, I added, I was thinking, this is an add problem. I asked myself what if I looked at it without parentheses?	numbers, place value chart, arrays, I was checking if I made a mistake.
P3	I was thinking if I was a 10th or 100th and I had to look closely.	I subtracted, I added, I used PEMDAS, I was thinking bring down the parentheses, bring down the number.	numbers, arrays, if I had ones or hundredths? I checked if I had 7 rows and 3 tenths.
P4	My brain and I multiplied, fractions, and I asked myself what you talking about?	I subtracted, I added, I divided, I used PEMDAS, I was thinking underline important stuff in the problem. I was looking for evidence to help my answer.	I was checking for after I did my work if it made sense or if it didn't make sense.

Figure 4. Using the language. This figure illustrates students beginning to the independently use the prompts. UNPACK=Underline the question, circle the Numbers, Preview the information, solve for an Answer, and CheckK your work. PEMDAS= Parentheses, Exponents, Multiply, Divide, Add, Subtract.

In an analysis of my field notes I found similar evidence that supports the use of the reading strategy prompts by the participants. During work session 3, I asked participant 4 why he erased his work and he responded with, "because it didn't look right." Another time during the mini lesson in work session 4, participant 3 raised his hand to say, "that doesn't sound right" when responding to another student's shared thinking. Later, in session 5 participant 4 said, "I checked that my answer made sense before I asked you to check it." It was evident that the participants were beginning to use the three main reading strategy prompts (Does it make sense? Does it sound right? Does it look right?). According to Clark and Graves (2004), the student internalizes the strategic action triggered by the scaffold, through practice and repeated experiences.

Overtime the student becomes independent in using the strategy to complete future tasks.

Conclusions and Implications

Conclusions

By conducting this study, I was able to come to several conclusions. They are: a) teacher language encourages student thinking, b) strategy instruction is guided by verbal scaffolding, and c) reading strategy prompts can be used in math.

Teacher language encourages student thinking. My first conclusion is that teacher language encourages student thinking. I discovered this through the progression of the participants' written reflections and their strategic actions over time. Across the five work sessions, as I implemented the use of the reading strategy prompts, participants began to write in more detail about their thinking and share questions they asked themselves. They began to justify and rationalize to construct meaning. These results may help other teachers learn to structure their language in a way that promotes thinking and provide learners with multiple opportunities to construct more complex understandings (Clark & Graves, 2004).

Strategy instruction is guided by verbal scaffolding. My second conclusion is that strategy instruction is guided by verbal scaffolding. I discovered this through my observations of the participants as they worked to solve word problems. At first, participants worked quickly to solve for an answer. They did not stop to check their progress or refer back to the question. With the use of reading strategy prompts over the five work sessions, participants began to develop a repertoire of strategies. They started monitoring their work by rereading and looking for visual information in both the

question and their work. Verbal scaffolding is an effective technique used to cultivate the independent use of reading strategy prompts (Lee & Schmitt, 2014).

Reading strategy prompts can be used in math. My third conclusion is that reading strategy prompts can be used in math. I discovered this by implementing the three main reading strategy prompts during my instruction in the work sessions. Students began thinking at a higher level and using strategies they did not use previously. They learned to ask questions to check for accuracy, and they began thinking about what made sense in relation to the concept being taught.

Summary of Conclusions. When teachers use purposeful language in the classroom, they have a positive impact on a student's thinking and strategic actions.

Implications

During this study, I developed conclusions and implications that may benefit other teachers and their students. These implications may improve teachers' pedagogy, student thinking, and student strategy use. The implications I suggest for educators and students in general are a) teacher language, and b) strategic action.

Teacher language. When used effectively, a teacher's language can have a positive effect on student learning. Specific questions and prompts guide student thinking and strategy use through social interactions. Thinking and higher cognitive development occur through social interaction (Lantolf & Thorne, 2006). Teachers should consider the language they use throughout instruction and guided practice.

Strategic action. Strategic action is an important aspect of learning. Students need to know what they can do to solve a problem or complete a task. They need to be prepared with strategies that they can incorporate to do so, in order to solve a problem. Teachers need to know what their students are able to do independently. From there

teachers can teach new strategies to help them become more independent. Therefore, teachers need to build relationships and get to know their students and how they attempt to solve problems. Strategy prompts are implemented during instruction to encourage their use (Clay, 1991)

Limitations

The limitations of this study include member checks and transferability. I was the only researcher collecting data, transcribing interviews and recording field notes. I did not work with other people to check the accuracy of my data or data analysis and reporting. In regards to transferability, my research only focuses on four participants over five work sessions. Therefore, my findings are not transferable to a larger population.

Suggestions for Future Research

A suggestion for myself as a researcher is I could teach the reading strategy prompts explicitly and see what happens. A suggestion for other researchers is to conduct a study that looks at the use of reading strategy prompts in classrooms across content areas (reading, math, science, social studies). They can focus on a whole class or a small group.

Overall Significance of the Study

It was important that I observed what happens when reading strategy prompts are used in math so I can see how the students respond to the prompts. This study is significant because it can lend support to teachers of all content areas and prompt students' metacognitive behaviors. The information can be used to create common scaffolding practices across the content areas.

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Appendix A

Interview Questionnaire

1. Tell me how you feel about word problems.

2. How do you solve word problems?

3. What do you find challenging about word problems?

4. How do you check your work for a word problem?

5. Why would it be important to check your work?

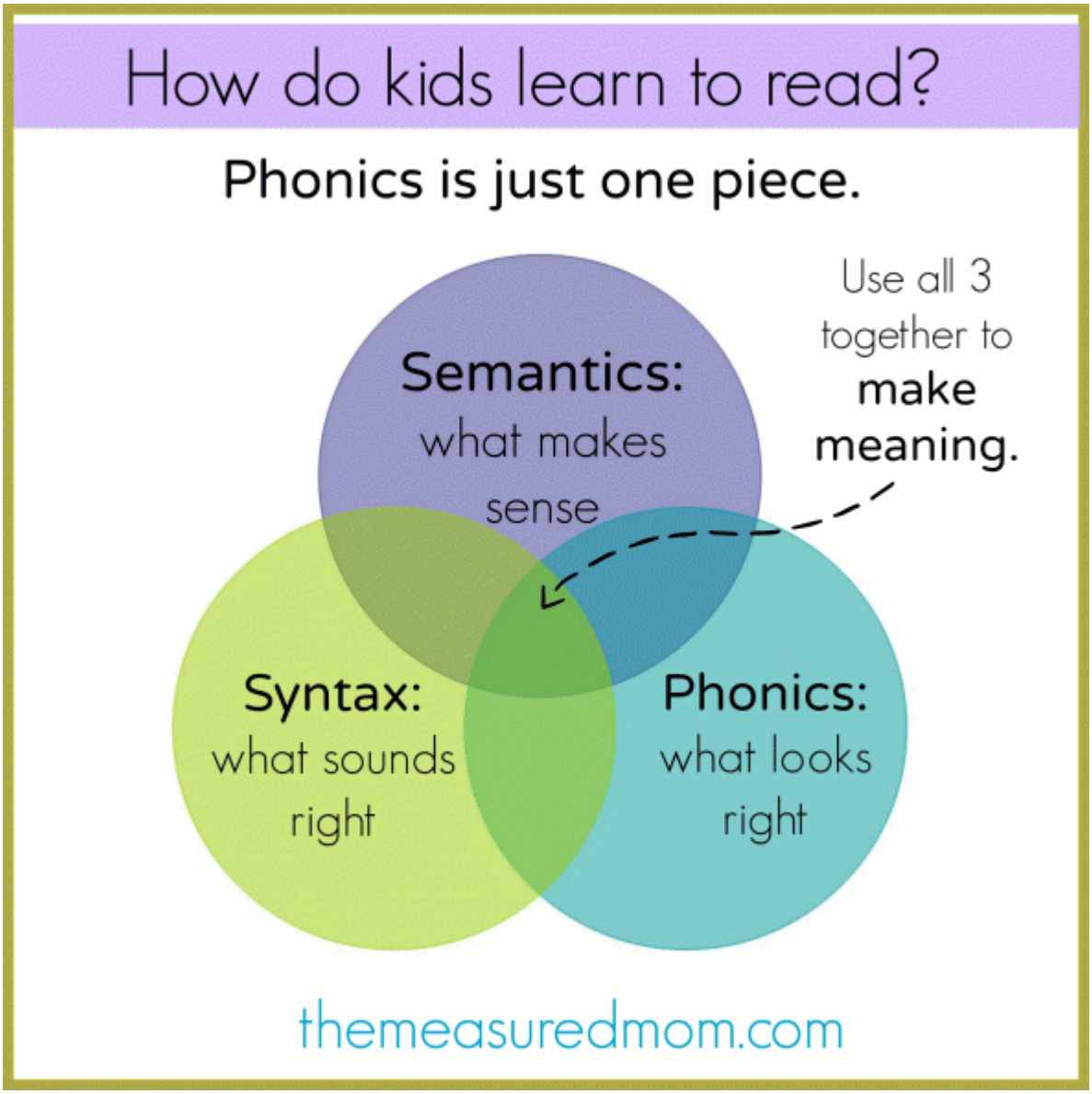
6. Where have you seen words in math?

7. What would you like to learn more about in math?

8. What do you do when you get to a tricky word in a math word problem?

Appendix B

Reading Strategy Prompts



Appendix C

Table 1 Coding Scheme (adapted from Ankrum et al. (2014))

Code	Definition	Examples

Appendix D

Table 2 Teacher Talk Codes (adapted from Ankrum et al. (2014))

Verbal Assistance Types	Definition	Examples

Appendix E

Table 3 Student Talk Codes (adapted from Ankrum et al. (2014))

Student Number _____

Student Language	Observer's Notes	Strategy Used

Appendix F

Journal Prompt

Student Number _____

Date _____

What strategies did you use to help you solve today's word problems?

_____

_____

_____

_____

_____

_____