5-2019

The Impact of Metacognitive Strategies on Fifth Grade Students' Reading Comprehension

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Submitted on May 17, 2019

in fulfillment of final requirements for the MAED degree

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Advisor: Amy Adams Date: May 17, 2019

Abstract

American educators continue to struggle to teach reading comprehension to students to whom it does not come naturally. This research focused on exploring the impact of explicit instruction in specific metacognitive strategies on students' reading comprehension assessment scores. Participants were fifth-grade students enrolled in a rural public elementary school. Pre- and post-instruction data collection included measures of frequency of metacognitive strategy use, comprehension assessment scores, and growth in reading comprehension. The eight month study involved explicit instruction for using metacognitive strategies while reading during the 40 minute whole group reading instruction block, three to five times per week. Students also had the opportunity for additional instruction in either small groups or individually during the guided reading block which occurred daily for approximately 20 minutes per group. Results showed that students who more frequently called upon and implemented metacognitive strategies while reading had higher reading comprehension scores, as well as more growth in reading comprehension.

Keywords: metacognitive strategies, reading comprehension strategies, assessment, growth, monitoring comprehension, upper elementary

Introduction

American students are behind in reading comprehension. According to a study reported in *School Psychology Review* a substantial number of US students (more than 30% of fourth graders and approximately 25% of eighth graders) are reading below a basic level of competency (Vorstius, Radach, Mayer, & Lonigan, 2013). In one Midwestern school district, 2017 MCA scores indicated that approximately 37% of the students in that district's elementary school (grades 3-5) had not achieved proficiency in reading comprehension. Even more alarming, at the start of the 2017-2018 school year, more than half of the students entering fifth-grade in that school were not reading at grade level upon entering the classroom. This problem is clearly widespread.

Unfortunately, it's proven time and again to be a struggle for educators to teach reading comprehension to students to whom it does not come naturally. Traditionally, when students have struggled with reading comprehension, they have almost always been given an intervention that focuses primarily on fluency or decoding. The problem with this, however, is that poor reading scores are not stemming from fluency and decoding issues. Instead, reading comprehension issues are rooted to a lack of instruction that focuses on teaching students how to use metacognitive strategies while reading a text. Through extensive reading and research, the teacher in this study has uncovered a multitude of empirical data that strongly supports the idea that, to teach reading effectively, students need direct instruction in how to use metacognitive strategies.

There is strong support in favor of teaching metacognitive strategies (such as comprehension self-monitoring) to students. According to Kolić-Vehovec & Bajšanski (2006), the results of many studies indicate that higher elementary school is a critical period for the

development of comprehension monitoring. Because of that, fifth-grade classrooms are an ideal setting to begin placing a strong focus on metacognitive strategies: monitoring comprehension, what that means, and how to do it.

American educators are at a loss for what to do for students who struggle with reading comprehension. Many reading curricula used in the United States focus heavily upon decoding and fluency for reading; however, these curricula often fail to emphasize the metacognitive strategies students need to successfully comprehend text. Therefore, the purpose of this action research study was to explore the use of explicit instruction in specific metacognitive reading strategies (such as self-monitoring of reading comprehension) with students. The research question that guided this study was, "What effect, if any, does explicit instruction in specific metacognitive reading strategies have on fifth-grade students' reading assessment scores?"

Literature Review

When students can self-regulate their thoughts and actions during reading, evidence points to better student outcomes in comprehension (Baas, D., Castelijns, J., Vermeulen, M., Martens, R., & Segers, M., 2015). To be able to self-regulate, students must be explicitly taught the skills and strategies needed to do so. Thinking about one's own thinking process has been labeled with the term "metacognition." Simply put, metacognition (when applied to reading comprehension) is the idea that one would think about their thinking as they read. In other words, one would monitor their own comprehension, and use strategies to improve comprehension as meaning breaks down for them in a text.

The theoretical basis for this research is the assertion that teaching students how to utilize metacognitive strategies improves reading comprehension. John H. Flavell coined the term

"metacognition" in 1979 (Chauhan, Ankit & Singh, Namrata, 2014). Metacognition involves activities such as planning how to approach a learning task, monitoring comprehension, and self-evaluating the one's own progress. The idea behind the theory is that when one can make the unconscious conscious or, in other words, when the learner can take active control of the cognitive processes involved in learning (Chauhan, Ankit & Singh, Namrata, 2014), they can better comprehend what they read.

Both theory and empirical data strongly support the idea that teaching metacognitive strategies to students improves reading comprehension. Because of that correlation, classroom instruction in this study was heavily focused upon direct instruction in metacognitive strategies such as self-monitoring, activating and connecting to background knowledge, questioning, visualizing, and inferring as a regular part of reading instruction. Metacognitive theory clearly suggests that teaching these strategies will create a positive outcome on student's reading comprehension assessment scores.

Time and again, researchers have found positive outcomes when students are explicitly taught metacognitive strategies and how to use them (Goudvis & Harvey, 2007). Trobasso and Bouchard (2002) found that:

> There is solid empirical, scientific evidence that the instruction of more than one strategy in a natural context leads to the acquisition and use of reading comprehension strategies and transfers to standardized comprehension tests. Multiple strategy instruction facilitates comprehension as evidenced by performance on tasks that involve memory, summarizing and identification of main ideas. (176)

Viadal-Abarca, Mana, and Gill (2010) determined that there is a correlation between skilled comprehenders and their ability to draw on metacognitive strategies when performing task-oriented reading activities. Additionally, Richardson (2010) strongly supports the idea that both [cognitive] pre-reading strategies (such as activating prior knowledge, vocabulary work, making predictions, and introducing themes), and during-reading [metacognitive] strategies (such as self-monitoring comprehension) were the most impactful on student comprehension. Educational theorists, Ankit Chauhan and Namrata Singh, have also asserted that teaching students metacognitive strategies can benefit them, not only in reading comprehension but in writing and other types of problem-solving as well (2014).

Active engagement and understanding of text require students to learn metacognitive strategies. In *Strategies that Work*, Harvey and Goudvis (2007) assert that there are six types of metacognitive comprehension strategies that students must learn:

1. Monitoring comprehension - tracking the "Inner Conversation"
2. Activation & connection to background knowledge
3. Questioning
4. Visualizing & inferring (implicit & explicit information)
5. Determining importance
6. Summarizing & synthesizing (Goudvis & Harvey, 2007).

These strategies work synergistically to help students construct the meaning of a text. Students must learn to be flexible and deliberate in their choice of strategy depending on the demand of the text and the reading task (Goudvis & Harvey, 2007).

The goal of direct instruction on how and when to use these metacognitive strategies is for students to eventually be able to switch between automatic processing of a simpler text (no

need for strategies) to a more deliberate form of processing when they encounter more challenging texts or when meaning breaks down for them. This ability to switch between automatic processing and deliberate processing of a text requires that students can, and do, continuously monitor their comprehension (Vorstius, Radach, Mayer, & Lonigan. 2013).

The first goal of this literature review was to uncover the theoretical basis and empirical data that support the idea of teaching metacognitive strategies to students to improve reading comprehension. The number of studies and educational theorists in support of this idea are numerous. The consensus seems to be that more and more data is mounting to show that metacognitive strategies aid students in their comprehension.

The second goal of this literature review was to identify what it means to teach and learn metacognitive strategies, and perhaps, to identify if there are some strategies that are more consequential than others. Many studies suggest that the idea of monitoring one's own comprehension is at the base of the hierarchy to all other metacognitive skills and strategies. This makes sense because, without this constant monitoring, one would not realize that meaning has broken down or that there are inconsistencies in the text. If one doesn't realize that meaning has broken down, there would be no basis for utilizing the other metacognitive strategies. Ultimately, because of the overwhelming number of positive outcomes in the literature that were reviewed, it was concluded that providing the students in the study with direct instruction on metacognition and metacognitive strategies will help those students to achieve higher levels of comprehension in their reading, and further, will improve student assessment scores.

Methodology

For this action research study, data collected from various assessment tools, including formative assessments, was leveraged in the interest of triangulation. The purpose of this was to determine whether or not direct instruction on and use of metacognitive strategies impacted students' reading comprehension assessment scores. The data used in this study was quantitative in nature.

The population for this study was 5th grade students enrolled in an elementary school in a small, Midwestern town in the United States (N=74). The sample was 24 fifth graders. Within this sample, there were 13 females and 11 males. The study took place during the course of the 2018-2019 school year, and happened within the students' required 5th grade English Language Arts block. The data collection tools that were used in this study included the Fountas & Pinnell (F&P) Guided Reading Benchmarking Tool, the Renaissance Star Reading Assessment (RSRA), both prior and current year Reading Minnesota Comprehensive Assessment (MCA) scores, and formative data (observations and self-reporting) collected during guided reading and reported on the Metacognitive Strategy Assessment (MSA) form (Appendix A).

The F&P Guided Reading Benchmarking Tool served to illustrate where each student struggled as an individual reader, as well as their individual guided reading level used during guided reading instruction. To carry out this assessment, each student read from a teacher-selected text at their estimated reading level. Students read a portion of the text aloud and finished the text silently. While students read, the teacher observed and documented the strategies the student used to make meaning of the text. After the student finished reading the text, the teacher asked appropriate comprehension questions and documented the progress. At that point, it was determined if the text was a good fit for them as a reader, or if an adjustment

needed to be made. If the text was not a good fit, the process was repeated until an appropriately leveled text was found.

The RSRA tool was used district-wide in the elementary school's district. This reading comprehension assessment was administered in the fall, winter, and spring. This tool served as an indicator of whether or not students were on track to pass the Reading MCAs and the specific English Language Arts (ELA) Standards with which they might struggle. Additionally, this report showed student growth in reading comprehension over the course of the year (fall, winter, and spring).

Student MCA scores demonstrated how a student traditionally performed on reading comprehension assessments in past years. From their scores, the teacher was able to determine whether or not they had met the grade level standards in prior years, as well as whether or not they had shown growth (and how much growth) from one year to the next. The score and level of growth from past years was compared with the current year's score and amount of growth.

During the 40-minute whole group reading instruction block, which took place three to five times per week, the teacher provided explicit instruction for using metacognitive strategies while reading. The intended strategy was modeled with the aid of a document camera and a shared reading passage. Students had the opportunity to practice the strategy either with a partner, a small group or independently. The gradual release of responsibility educational model was used during this instruction.

Students had the opportunity for additional instruction in either small groups or individually during the guided reading block, which occurred daily for approximately 20 minutes per group. During this time, students practiced using the metacognitive strategies modeled to them during whole group instruction. They read aloud to the teacher from an appropriately

leveled text (as determined by the F&P Benchmark Assessment) or completed a task to illustrate their use of the strategies as they read independently. This was a time where students were coached or guided in the use of the metacognitive strategies. Students who needed more guidance in strategy use spent more time with the teacher during this block. Those who did not need as much coaching worked independently on reading a text and completing the appropriate graphic organizer to show their thinking.

During this time, the teacher specifically looked for evidence that the student was: a) monitoring comprehension and tracking the "inner conversation"; b) activating and connecting to background knowledge; c) questioning the text; d) visualizing and inferring both implicit and explicit information. The teacher also looked for evidence that the student was flexible and deliberate in their choice of strategy, and that they called upon the correct strategy in regard to the demand of the text and reading task they were asked to complete. The teacher also took notice of whether or not students were making the switch between automatic processing of the text to more deliberate processing (use of strategies) when meaning broke down for them as they read.

The guided reading block was also when formative assessment data was gathered by the teacher. To collect data on the frequency with which students called upon metacognitive strategies when reading, the teacher created the Metacognitive Strategy Assessment (MSA) form. The MSA was a series of three passages which contained inconsistencies within them. These inconsistencies called for students to: a) carefully monitor comprehension and track the "inner conversation"; b) activate and connect to background knowledge; c) question the text; d) visualize and infer both implicit and explicit information. The teacher asked the student to read the passage aloud, and then noted on the tracking form whether the student took notice of the

inconsistencies, and therefore was actively self-monitoring as they read. The use of strategies was assessed by listening to and observing students as they read, as well as verbal self-reporting by the students regarding what strategies they called upon to aid in their comprehension. The teacher also asked a series of questions at the end of each passage to further examine whether the student was, in fact, calling upon metacognitive strategies as they read or as meaning broke down for them. The teacher made observations and took notes on the reporting form.

Once the data was collected, scores from the assessment tools and formative assessment data collected by the teacher was combined. The goal was to determine whether students who more frequently called upon and used the metacognitive strategies they had learned showed more growth or higher assessment scores than those who did not. In order to determine this, it first needed to be determined which students most frequently utilized metacognitive strategies while reading. This was determined by the formative assessment data collected from the MSA during guided reading. Once frequency of strategy use was determined, each students' assessment scores and progress were entered onto a graph, along with the frequency of use of metacognitive strategies while reading. The teacher then looked for a positive correlation between strategy use and assessment scores/growth.

Data Analysis

The research question that this study addressed dealt with determining whether or not explicit instruction in specific metacognitive strategies had an effect on students' reading assessment scores. To answer this question, the teacher collected data from various assessment tools and leveraged the data for triangulation. The data collection tools that were used in this study included the Fountas & Pinnell (F&P) Guided Reading Benchmarking Tool, the

Renaissance Star Reading Assessment (RSRA), both prior and current year Reading Minnesota Comprehensive Assessment (MCA) scores, and formative data collected during guided reading, and reported on the Metacognitive Strategy Assessment (MSA) form (Appendix A).

The raw data collected in this study was in the form of teacher observations and notes collected using the Metacognitive Strategy Assessment. Individual student reporting forms were analyzed to determine the frequency of metacognitive strategy use while reading. Each reporting form included ten indicators of strategy use. All participants had three reporting forms, one for each reading passage. The three passages had a combined total of 33 points, and one point was given each time a student called upon an appropriate metacognitive strategy while reading. A percentage of 70-100 across the three forms indicated high evidence of use. A percentage of 50-69 indicated average evidence of use, and a percentage of 0-49 indicated low frequency of use. Based on this usage score, the students were then organized into three groups: High Evidence of Use, Average Evidence of Use, or Low Evidence of Use.

These three groups were then used to create two tables. The first table illustrated whether or not there seemed to be a connection between frequency of strategy use and the average reading level (as determined by the F&P Benchmark Assessment), the average MCA score, or the average RSRA score of that group. The second table demonstrated whether or not there was seemed to be a connection between frequency of strategy use and growth in reading level (as determined by the F&P Benchmark Assessment), growth in MCA score, or growth in RSRA score of that group.

Frequency of use in metacognitive strategies had an impact on reading comprehension assessment scores. In this study, students who utilized metacognitive strategies less frequently scored lower on each of the given assessments. Scores increased as strategy use increased (Table

1). This was especially true for scores on the RSRA and the MCA assessments, in which the difference in scores between the low use group and the high use group were statistically significant when a statistical t-test was applied. Despite the illustration of a clear increase in comprehension assessment scores between the other groups, the difference in scores between the low to average use groups and average to high use was not statistically significant according to the t-test.

Table 1

Average Assessment Scores

Assessment	*Low Use*	*Average Use*	*High Use*
F&P Benchmark Assessment	*17.4*	*19*	*20.7*
RSRA	*486*	*601*	*767*
MCA	*544*	*553*	*560*

Frequency of use in metacognitive strategies did not, however, illustrate an overall impact on student reading comprehension growth. Students who used metacognitive strategies more frequently showed more growth on the F&P Benchmark Assessment than those who used them less frequently (Table 2). On the RSRA, there was a significant increase in growth between the low use and average use groups, but a decrease in growth from the average use to high use group. On the MCA, however, students who used strategies less frequently actually showed more growth than those who used them more frequently.

Table 2

Average Growth Scores

Assessment	*Low Use*	*Average Use*	*High Use*
F&P Benchmark Assessment	*.6*	*1.3*	*1.8*
RSRA	*46*	*111*	*68*
MCA	*4.7*	*4.4*	*3.7*

Action Plan

The intention of this study was to determine whether or not explicit instruction in, and therefore student use of, specific metacognitive reading strategies resulted in higher reading assessment scores or greater student growth on reading comprehension assessments. By asking the question, "What effect, if any, does explicit instruction in specific metacognitive reading strategies have on fifth-grade students' reading assessment scores?" and collecting data from various assessment tools, the teacher was able to leverage and triangulate the results to determine any connections.

Based on the findings of this study, it appears that when students learn and make use of metacognitive reading strategies, their reading assessment scores do, in fact, increase. This was shown to be true on all three assessments administered to students over the course of this study. These findings support the findings of Viadal-Abarca, Mana, and Gill (2010) when they determined that there is a correlation between skilled comprehenders and their ability to draw on metacognitive strategies when performing task-oriented reading activities. The findings also

support the assertions of educational theorists, Ankit Chauhan and Namrata Singh (2014) who asserted that teaching students metacognitive strategies can show a benefit in reading comprehension.

Conversely, this study did not conclusively illustrate a strong connection between reading assessment growth and use of metacognitive strategy use. Growth did increase on the F&P Benchmark Assessment, but was not consistent on the RSRA, and on the MCA it showed a reversal in growth. Scores increased with heightened use, but growth did not. There could be many reasons for this, one of them being the group of students who showed high strategy use were already scoring at or above grade level on the assessments, and they had less room for growth overall. However, because the F&P Benchmark Assessment is based only on reading level growth, students all had room to improve.

Because of the strong connection shown between metacognitive strategy use and reading assessment scores, the teacher recommends that explicit instruction on specific metacognitive strategies remain an integral part of her reading curricula. As Goudvis & Harvey (2007) asserted, these strategies work synergistically to help students to construct the meaning of a text. In fact, it would seem that all reading curriculum used in all schools should be heavy with metacognitive strategy use and instruction. When curriculum heavy with metacognitive strategy use is not available to the teacher, it is recommended that it be incorporated on a daily basis, or as often as possible. As shared in the introduction to this study, American students are behind in reading comprehension. A valid solution to this widespread problem is to incorporate explicit instruction on metacognitive reading strategies into reading classrooms nationwide.

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Appendix A

Metacognitive Strategy Assessment (MSA) Form

The Penny Tree

"What are you getting Pete for his birthday? my older sister, Betsy, asked. Pete was my younger sister. He was going to be 5 years old, and I hadn't gotten him a thing.

"I'm still thinking about it," I answered, as I wedged my hand between the couch cushions.

"You are not thinking," Betsy shot back. "You are couch fishing for change because you're broke."

"I've got plenty of cash," I lied, my fingers desperately clawing the mysterious spaces within the couch.

"Jack, you spend all your money on yourself," she said, reading my mind. I had just spent most of my cash on a David Ortiz football card.

"Aha!" I shouted, and pulled an old penny out of the crack. "Now I've got something for Pete." I held the penny up for her to see. "This little penny will change his life," I announced, without the slightest idea how it might do so. But I kept talking. "You don't need a lot of cash to give a great gift." I rapped my knuckles against my head. "You just need a generous imagination."

"That's just another way of saying you are cheap!" she said, sneering.

"Just you wait," I snapped back. "With this one penny, I will steal the birthday gift-giving show."

"Put your money where your mouth is," she said. "I bet 10 bucks- that's a thousand pennies- that my gift will be his favorite."

"You're on," I replied, thinking that I did need a "generous imagination."

After dinner, Mom bought out the birthday cake. She blew out the five candles and said to Pete, "Make a wish."

"Pete's eyes rolled up toward the ceiling as he sucked up a whole roomful of air into his lungs, then leaned forward. The five little flames didn't know what hit them. In a split second, there was nothing left but vanishing trails of smoke.

"OK," Pete announced, grinning. "I'm ready to open presents."

"Mom and Dad lifted a big box onto the table. Small hockey players skated across the wrapping paper. Pete ripped it open with one swipe and lifted the top off the box. There were a set of Rollerblades and elbow and knee pads, and an orange street-hockey ball. "Awesome," Pete shrieked, and threw his arm around Mom and Dad. "Thank you," he said, then suddenly he turned to Betsy. "Next," he said.

She took him to the back window and pulled the curtain aside. I looked over Pete's shoulder. On the lawn were a hockey net, a regulation hockey stick, and a goalie's stick. "You are the best sister on the planet," he said and gave her a hug.

Then he looked at me. I felt confident. Since I'd had a ton of money to spend on his present, I knew mine would be best. I couldn't wait to see his face when he opened it.

Name:

Date:

Evidence of Strategy Use	+/-
Question 1 (I)	
Question 2 (I)	
Question 3 (Q)	
Question 4 (MC)	
Question 5 (IC)	
Question 6 (V/Q)	
Question 7 (I)	
Text Inconsistency 1 (MC)	
Text Inconsistency 2 (MC & BK)	
Text Inconsistency 3 (MC)	

Coding	
MC	Monitors Comprehension
BK	Calls Upon Background Knowledge
I	Makes & Supports Inferences
V	Visualizes the Text
Q	Questions the Text

The Amazing Hummingbird

Hummingbirds are truly amazing animals. The bee hummingbird hatches out of an egg the size of a pea and at full adulthood weighs only about as much as a pony. If it had no feathers, it would be about the size of a large bumblebee.

The speed of hummingbirds is stunning. Pause for a moment and blink your eyes. In the time it takes you to blink your eyes, a bee hummingbird can beat its wings 80 times, and it does this for hours on end. The sound of the rapidly beating wings makes a sort of “hummmmmmm,” this the name, “hummingbird.” Amazingly, hummingbirds can fly backwards and upside down, just like Bluebirds. No other bird or insect can do that. The next time you are in a car, ask your mom or dad to tell you when they are driving at 30 miles per hour. That is how fast hummingbirds can fly.

Their migration habits are incredible as well. There are two ways for birds to travel from Texas to Florida. Some go around the Gulf of Mexico, stopping to eat and rest along the way. But the ruby-throated hummingbird migrates, or travels, across the Gulf of Mexico, covering about 500 miles without stopping to eat or rest. And it is a biannual trip. This means that they do it twice a year. And they do it alone. They travel with the ducks and geese. Hummingbirds do not travel in flocks. This tiny creature crosses that huge expanse of water without any stops or navigational aids!

Do you know what your pulse is? Your pulse is the number of times your heart beats per minute. Yours is about 70-80. Ornithologists have clocked the hummingbird’s pulse at an astounding 1,260 beats per minute! To keep this up, they need nourishment. They need to eat. And eat is what they do - every 10 to 15 minutes during the day. In fact they eat about twice as much each day as they weigh. Hummingbirds are mostly nectarivores, which means they mostly eat nectar. Nectar is the sweet thick juice that is found deep inside most flowers.

Are you impressed yet? One can hardly read about the hummingbird and not be astounded. Hummingbirds are just ordinary animals - nothing interesting about them.

Name:

Date:

Evidence of Strategy Use	+/-
Question 1 (I)	
Question 2 (Q)	
Question 3 (MC)	
Question 4 (MC)	
Question 5 (V/Q)	
Question 6 (BK)	
Text Inconsistency 1 (MC)	
Text Inconsistency 2 (MC)	
Text Inconsistency 3 (MC)	
Text Inconsistency 4 (MC)	

Coding	
MC	Monitors Comprehension
BK	Calls Upon Background Knowledge
I	Makes & Supports Inferences
V	Visualizes the Text
Q	Questions the Text

Inertia

When a ball flies through the air, it keeps moving until a force stops it. The push of a fielder's hand is a force that can stop a ball. Force is also needed to make a ball move once it stops. Throwing or hitting the ball can provide that force.

An object either remains in motion or stays at rest until a force acts on it. The tendency of objects to stay in motion or to stay still is called inertia. Every object, whether it is moving or at rest, has inertia. In order to start something moving or to stop it from moving you need to use a force to overcome its inertia.

Have you ever felt yourself jerk forward when you were riding in a vehicle that stopped suddenly? If so, you have felt inertia. That inertia is the reason you need to wear a safety belt in a moving vehicle. The safety belt helps prevent injuries. It keeps your body from continuing to move if the vehicle stops suddenly.

Inertia can affect passengers in a bus. If the bus starts to move forward suddenly, inertia causes their bodies to tend to stay in the same place. The passengers' bodies seem to jerk backward. If a moving bus stops suddenly, inertia causes their bodies to keep moving forward.

Name:

Date:

Evidence of Strategy Use	**+/-**
Question 1 (I/BK)	
Question 2 (Q)	
Question 3 (MC)	
Question 4 (MC)	
Question 5 (Q)	
Question 6 (V)	
Question 7 (Q)	
Question 8 (BK)	
Question 9 (MC)	
Question 10 (MC)	

Coding	
MC	Monitors Comprehension
BK	Calls Upon Background Knowledge
I	Makes & Supports Inferences
V	Visualizes the Text
Q	Questions the Text