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Reading Comprehension in Deaf Education: Comprehension Strategies to Support Students Who are Deaf or Hard of Hearing

Abstract

Because students who are deaf or hard of hearing often struggle with reading comprehension, this research study asks “what strategies can be used to successfully support the development or improvement of reading comprehension of students who are deaf or hard of hearing?” Using data collected from questionnaires, focus groups, and student scores before and after interventions, the conclusion was that there are several different strategies that are currently being used with students who are deaf or hard of hearing to support their reading comprehension. The implications of this study can be used to educate teachers of the deaf about which strategies support reading comprehension for students who are deaf or hard of hearing.

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Reading Comprehension in Deaf Education:
Comprehension Strategies to Support Students Who are Deaf or Hard of Hearing

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Abstract

Because students who are deaf or hard of hearing often struggle with reading comprehension, this research study asks “what strategies can be used to successfully support the development or improvement of reading comprehension of students who are deaf or hard of hearing?” Using data collected from questionnaires, focus groups, and student scores before and after interventions, the conclusion was that there are several different strategies that are currently being used with students who are deaf or hard of hearing to support their reading comprehension. The implications of this study can be used to educate teachers of the deaf about which strategies support reading comprehension for students who are deaf or hard of hearing.

Reading Comprehension in Deaf Education

Students who are deaf or hard of hearing often struggle to develop or improve crucial literacy skills. One of the most difficult skills for them to master is reading comprehension. According to van Staden (2013), “The reading skills of many deaf children lag several years behind those of hearing children, and there is a need for identifying reading difficulties and implementing effective reading support strategies in this population” (p. 305). This study explores multiple strategies that teachers can use with students who are deaf or hard of hearing to support the development of good reading comprehension skills.

The population of students who are deaf or hard of hearing typically struggle with acquiring crucial literacy skills and/or obtaining reading abilities past the elementary level. “Reading comprehension is an ongoing concern for students who are deaf or hard of hearing” (Benedict, Rivera, & Antia, 2015, p. 1) making the topic of reading comprehension extremely important. Sullivan and Oakhill (2015) mention that “there has been relatively little progress in improving narrative comprehension in DHH readers despite decades of research” (p. 134), proving a need for further research into this topic.

The lack of literacy skills in students who are deaf or hard of hearing leads to their struggle in the secondary grades as well as throughout their college careers or in the post high school job market, unlike their hearing peers. Hoffman and Wang (2010) note that:

Research in to the academic achievement of students who are deaf or hard of hearing often finds that the performance of many children in this population falls significantly below that of their typical hearing peers on many measures and across many domains.

(p. 131)

In order for these students to stay on grade level and graduate with the skills necessary to either be a successful college student or find a decent job after high school, teachers of the deaf need to be made aware of any methods or strategies they can use to successfully support the development of reading comprehension skills in their students. Unfortunately, “One of the major challenging tasks of educators of deaf and hard of hearing students is to enhance the reading comprehension performance of their students” (Nikolarazi, Vekiri, & Easterbrooks, 2013, p. 485). Part of this challenge is that students who are deaf or hard of hearing often fail to grasp that the point of reading is to understand what they are reading, not just read the words (Benedict, Rivera, & Antia, 2015).

Students who are deaf or hard of hearing develop language and literacy skills in somewhat of a different way than students who are hearing. One example of this is incidental learning. Students who are hearing acquire some of their language from parents, siblings, TV, and radio. Students who are deaf are less exposed to language during their early years, especially if their parents are hearing and do not learn sign language. As Friedmann and Szterman (2010) note, “Many children whose hearing is impaired receive limited language input during the sensitive period for language acquisition” (p. 212). In addition to limited language input, many of the strategies used to help hearing students improve their literacy skills often need to be modified for students who are deaf or hard of hearing. By conducting this research, my goal is to discover a set of strategies that can be used (or modified as needed) in classrooms with students who are deaf or hard of hearing in order for them to develop or improve their reading comprehension skills.

The main research question of this study was “What strategies can be used to successfully support the development or improvement of reading comprehension of students who are deaf or

hard of hearing?” Some of the tools I used in order to collect data to answer the research question were teacher and student questionnaires, student work, and a transcription of a focus group. The findings of the research showed that many typical reading comprehension strategies were successful when used by students who were deaf or hard of hearing. The research also revealed some strategies that are not typically used with struggling reader, but were tailored to meet the needs of students who were deaf or hard of hearing. Lastly, the data showed that some strategies do not increase the reading comprehension skills in students who are deaf or hard of hearing. The implications for teachers include implementing typical reading comprehension strategies with students who are deaf or hard of hearing, as well as some strategies that need to be tailored to meet those student’s needs. An additional implication for teachers is to stay away from using strategies that are proved to be unsuccessful at supporting reading comprehension in students who are deaf or hard of hearing.

Theoretical Framework

Freebody and Luke (1990) say that “Literacy is a multifaceted set of social practices with material technology, entailing code breaking, participation with the knowledge of the text, social uses of text, and analysis/critique of the text” (p. 15). According to Kucer (2009):

Becoming literate means learning to effectively, efficiently, and simultaneously control the linguistic, cognitive, sociocultural, and developmental dimensions of written language in a transactive fashion. In a very real sense every act of a real world use of literacy involves these four dimensions. (p. 5)

Students who are deaf or hard of hearing still need to acquire these dimensions of literacy, but face obstacles in doing so. More specifically, attaining the linguistic aspect is a challenge for these students.

There are many aspects of literacy, as well as factors that affect literacy acquisition. Culture is one such factor that affects literacy acquisition (Bedard, C.; Van Horn, L.; & Garcia, Viola M., 2011; Ferdman, 1990; Kucer, 2001; Meier, 2003; Wolfram, 2000). A person's culture will determine most of his or her background knowledge, which is a crucial component to reading comprehension. In the construction and comprehension of language, cultural identity and language should be closely linked (Ferdman, 1990).

One of the first ways that culture impacts literacy acquisition has to do with a student's family (Bedard et al, 2011). If students are raised in families that read to them, they will be more familiar with the process of story time and concepts of print when they enter school. However, if a student is not raised in a household with regular reading, that student may find it difficult to follow reading procedures or even to simply sit still during reading time (Meier, 2003). This cultural impact on literacy acquisition also applies to students who are deaf or hard of hearing. In addition to this, if students who are deaf or hard of hearing are not exposed to language through sign language or other means during their early years, those student will struggle to catch up to their peers later on in their education.

Ferdman (1990) discusses the constructive and destructive impacts a teacher can have on a student. Culture can enhance the multi-cultural student's identity in the classroom when we teach them more about their own cultures and backgrounds. Ferdman also discusses students becoming more engaged and having the ability to acquire meaning when an assignment is

connected to that students' cultural identity. An example of connecting a student's culture to an assignment for students who are deaf or hard of hearing would be to allow them to use technology to record themselves signing an essay or a story as an assessment. If we can acknowledge the role cultural identity plays in a student's life, then Literacy Education can augment that student's self-esteem (Ferdman, 1990).

To guide this study, I looked through the critical lens of Culture "as" Disability theory (McDermott & Varenne, 1995). Part of this theory holds that "American education has numerous made-to-order general categories for describing children in trouble" (McDermott and Varenne, 1995, p. 331). One of the example labels listed for students in America was "disabled". However McDermott and Varenne also mention that deaf individuals view themselves as part of the Deaf culture, not as being disabled. This view of not being disabled also applies to the students who are deaf or hard of hearing.

McDermott and Varenne (1995) say that "The first [contextualization] answers the question of what is wrong with their life by focusing on what is wrong with them: the children and often their families" (p. 330). Teachers of the Deaf are trained through educational programs on the different strategies needed to work with deaf students, but instead of viewing them as regular students who cannot hear and just need some extra support, sometimes teachers view them as disabled. This view of the students who are deaf or hard of hearing often results in them not being challenged enough or missing out on educational opportunities they would receive if they were hearing students. Teachers also look at the families of the students who are deaf or hard of hearing and place the blame for the student's lack of success on the parents. If the parents are deaf themselves and do not have a certain level of literacy skills, they are often judged to be the reason their student is also falling behind their hearing peers. On the other hand,

if the parents are hearing, but do not learn sign language, they are judged for not giving their child access to language at the crucial literacy stages.

While it can be argued that the deaf in general are privileged by the structures of their schools, it can also be argued that all the students within the schools are marginalized out in their communities. McDermott and Varenne said “It is possible to organize a culture in which deafness does not have to isolate a person from a full round in the life of a community” (p. 328). However, this is currently not the reality of our world. Because of this, the deaf or hard of hearing student’s culture is often viewed as disability by people outside of the schools, in their communities. It is more difficult for students who are deaf or hard of hearing to obtain jobs after high school because of the stigma placed on their culture and possible lack of literacy skills.

Research Question

For the purpose of this study, using the topic of reading comprehension in students who are deaf and hard of hearing with the critical lens of Culture “as” Disability the research question is the following: What strategies can be used to successfully support the development or improvement of reading comprehension for students who are deaf or hard of hearing?

Literature Review

In order to understand and research how students who are deaf or hard of hearing gain reading comprehension skills, it is important to review the recent literature published concerning this topic. Three themes will be explored within this literature review. The first themes focuses on strategies that have been used with deaf or hard of hearing students in order to increase their literacy skills, especially in the area of reading comprehension. Multiple different strategies have been tested in classrooms with students who are deaf or hard of hearing with the goal of increasing their reading skills to a level comparative with their hearing peers. Some of those

strategies resulted in successful improvement of reading comprehension, where others showed no difference in the student's skills after the intervention time frames. It is also important to note that most of these strategies are specifically designed for students who are deaf or hard of hearing as opposed to typical struggling readers who are hearing. The second theme will identify different factors that affect reading comprehension skills of students who are deaf or hard of hearing. Since vocabulary knowledge and phonology play significant roles in reading and reading comprehension, it is important to explore the specific effects these two things have on the reading comprehension of students who are deaf or hard of hearing. It will also be important to explore the effects of Mode of Acquisition and syntactic knowledge. Mode of Acquisition discusses the role of how students acquire the vocabulary words that they do during literacy development phases and how this affects their reading comprehension skills, while syntactic knowledge looks at the impact of having a first language with a different syntax than English. The last theme will discuss recent research regarding reading comprehension skills of students who are deaf compared to students who are hard of hearing and students who are deaf, but use cochlear implants. Some studies suggest that deaf students who have and use cochlear implants perform better in reading comprehension than their deaf peers who do not have cochlear implants. Studies also suggested that the students who are hard of hearing and use assistive devices, such as hearing aids, also outperform the students who are deaf with no hearing enhancement capabilities.

In addition to not having oral language exposure as infants, students who are deaf or hard of hearing struggle with English because American Sign Language (ASL) has a different structure than English. Freidmann and Szterman (2011) support that theory by stating that "Hearing loss during the critical period for language acquisition restricts spoken language input.

This input limitation in turn may hamper syntactic development” (p. 212). ASL is also a visual only language conveyed using ones hands, facial expression, and body language. There has never been a written form of ASL. Hoffman and Yang (2010) add to these concepts by stating that “The differences between any English language learner’s native language and English are compounded for learners who are deaf or hard of hearing by the fact that ASL has no written form” (p. 131). Students who are deaf or hard of hearing also need support in learning to read so that they are not left out of communication within our society. On that topic, Daza, Phillips-Silver, Ruiz-Cuadra, and Lopez-Lopez (2014) state:

Learning how to read is one of the most important tasks that deaf children have to face. Since our society transmits the majority of information in an oral way, good reading skills are a very efficient mean of receiving and acceding information for deaf individuals. (p. 3526)

In agreement with Daza, Phillips-Silver, Ruiz-Cuadra, and Lopez-Lopez (2014) and Hoffman and Yang (2010), Hermans, Knoors, Ormel, and Verhoeven said that “Learning to read is vital for individuals to participate in society, even more so when those individuals are deaf” (p. 518).

Researched Reading Comprehension Strategies for Deaf Students

Hoffman and Wang (2010) note that:

Factors such as degree of hearing loss, the extent to which children have access to phonological information about speech, and whether parents share a language with a child all appear to be implicated in determining the degree to which children can access and comprehend text. (p. 131)

Student who are deaf or hard of hearing often struggle with literacy skills, and especially with the comprehension of written text. The reasons that students who are deaf or hard of hearing

struggle with reading abilities can be described with this statement made by Mich, Pianta, and Mana (2013):

Deaf children have significant difficulties in comprehending written text. This is mainly due to the hearing loss that prevents them from being exposed to oral language when they were an infant. However, it is also due to the type of educational intervention they are faced with, which accustoms them to decoding single words and isolated sentences, rather than entire texts. (p.34)

Multiple different strategies have been tested in classrooms with students who are deaf or hard of hearing with the goal of increasing their reading skills to a level comparative with their hearing peers. Staden (2013) suggests that “The reading skills of many deaf children lag several years behind those of hearing children, and there is a need for identifying reading difficulties and implementing effective reading strategies in this population” (p. 305). In other words, it is the duty of educators of the deaf to identify their students’ needs and explore strategies to help them improve their reading skills. In agreement, Dimling (2010) states that “intense, targeted interventions that use evidence based approaches are imperative for students with a disability such as hearing loss to minimize its impact and maximize language development” (p. 425). These concepts are all good reasons to regard the research of reading strategies that can support deaf or hard of hearing students as extremely important for educators. Miller (2005) conducted research regarding reading comprehension and its relation to the amount of functional hearing a deaf or hard of hearing student may have, and when his finding did not confirm his hypothesis, one thing he stated was that “focusing on reading strategies of individuals with hearing loss may be a more fruitful approach to understanding the underlying causes of their reading problem” (p. 317).

In an attempt to improve the reading skills of students who are deaf or hard of hearing, multiple researchers have tried adding pictures or graphic representations to stories and books. Like many other researchers, Mich, Pianta, and Mana (2013) realize that students who are deaf or hard of hearing face serious obstacles in the area of comprehending written text. To test if adding visuals would aid students who are deaf or hard of hearing with their reading comprehension, they used interactive stories from a web based program with their students. One goal of their study was to determine if deaf or hard of hearing students and hearing children could all perform better in the area of reading comprehension if the stories were simplified as well as illustrated. A similar study done by Nikolarazim, Vekiri, and Easterbrooks (2013) examined how students who were deaf used the visual resources of a multimedia software package. The software was designed to reinforce reading comprehension skills. In both cases, the post assessments showed an increase in comprehension skills after the interventions had been used with the students. Gentry, Chinn, and Moulton (2004/2005) also assessed the addition of visual aid by researching the effectiveness of multimedia reading materials with students who were deaf or hard of hearing. Using personal computers, 25 students were given stories on CD-ROMs. The stories were presented in four different formats, print only, print plus pictures, print plus sign language, print plus pictures and sign language. Results indicated that the format in which students had the highest reading comprehension scores was the print and pictures, as opposed to the assumed print, plus pictures, plus sign language. The authors noted that “This finding was somewhat surprising because it defied assumptions that children who are deaf and using sign language in their everyday communication would benefit from having sign language given as a reading cue” (p. 400). The results of this study the two previous studies findings in that adding visuals to text can enhance the reading comprehension of students who are deaf or

hard of hearing. A fourth visual based study was conducted by Hoffman and Wang (2010). However, instead of using illustrated stories similar to the previous two studies, they added sign language graphics to the books used for the reading instruction within the classroom. This intervention was used with two students, a boy and a girl, in a first grade class of 13 students. The teacher used a reading workshop model for instruction with the students; however, the books were modified by having the sign language graphics attached under the words. Using the student observations gathered during instruction time, the researchers made note that “When reading the modified books, the students were more likely to focus on the English print rather than derive meaning exclusively from the illustrations” (p. 135). The results of the first study by Mich, Pianta, and Mana (2013) indicated that while students who were hearing (the control group) still outperformed the students who were deaf or hard of hearing, simplifying and illustrating the story had a positive impact of the comprehension of all students involved in the study. These results lead researchers to believe that adding visuals with text support reading comprehension skills in students who are deaf or hard of hearing. The results of the second study conducted by Nikolarazim, Vekiri, and Easterbrooks (2013) also showed a positive correlation between added visuals and reading comprehension. They also noted that the students appreciated the used the majority of the visual resources offered in the software. Gentry, Chinn, and Moulton (2004/2005) noted in their results that “pictures were shown to be a powerful factor in the transfer of factual information during the reading process” (p. 401). It should be noted that the fourth study had a younger and smaller group of participants compared to the first three studies. However, Similar to the first three studies, the results of the study done by Hoffman and Wang (2010) also had a positive effect on the comprehension scores of the Deaf students.

Wang and Paul (2011) hold the opinion that “In essence, there is a need for *intervention research*, a form of applied research with a focus on evaluating literacy instructional practices” (p. 57). To this end, they conducted a slightly different type of study that used a mixed method research design to compare and contrast a technology based literature program (The Cornerstone Project) and another instructional method they deemed the “typical approach” to determine the effects they would have on the reading comprehension of students who are deaf or hard of hearing. The Cornerstone Project used video based stories in addition to technology which changed the stories to match the students’ communication modes. The various modes that the stories could be changed to were, American Sign Language, Signing Exact English, and Cued Speech/Language. Unlike the visual based studies conducted by Mich, Pianta, and Mana (2013), Nikolarazim, Vekiri, and Easterbrooks (2013), and Hoffman and Wang (2010), the experiments conducted using the two programs ended with mixed results. However, the majority of the reports showed an increase in comprehension skills with the use of The Cornerstone Project program. Interestingly, Wang and Paul (2011) considered fatigue on the part of the participants to be a partial reason for the mixed results, noting that:

During the assessments, the Word Knowledge portion was administered last. Students were requested to say everything they knew about a word, for 20 words, and after the other. Clearly, some students became fatigued, not only because of the number of words, but also because the words were presented out of context. (p. 66)

Other studies have been conducted with students who were deaf or hard of hearing to test reading comprehension strategies that do not have any visuals added to the text. Unlike the previous studies discussed in this section of the review, Schirmer, Schaffer, Therrien, and Schirmer (2012) investigated the effect of a specific reading comprehension strategy with deaf or

hard of hearing students that did not include images pictures or videos. They wanted to use a strategy that is often used with hearing students who are struggling readers. The intervention is titled Reread-Adapt and Answer-Comprehend (Therrien, Gormley, & Kubina, 2006) and was a supplement to the students' regular reading instruction. To assess the students, daily observation data was taken during the intervention as well as pre-tests and post-tests: running records and four reading subtests of the Woodcock-Johnson III Achievement Tests. Even though results showed no difference in the reading comprehension subtest from the Woodcock-Johnson III Achievement Tests, the observational data collected indicated that the students showed steadily good comprehension on both the literal and inferential questions during the Reread-Adapt and Answer-Comprehend interventions (Schirmer, Schaffer, Therrien, & Schirmer, 2012). In order to ensure that reading comprehension itself improved upon the authors suggest adding a comprehension monitoring strategy with the Reread-Adapt and Answer-Comprehend intervention.

Benedict, Rivera, and Antia (2015) researched a metacognitive strategy to increase Deaf and Hard of Hearing students' reading comprehension. They used an intervention called Comprehension, Check, and Repair Strategy. The strategy is described as:

The purpose of the CC&R is to teach students how to use a self-questioning technique to monitor their own comprehension. The strategy is designed to be used with content-area text, allowing for integrated instruction in content, reading comprehension, and metacognition. Students monitor comprehension by periodically stopping during reading to ask themselves whether they understand what they read and if they were already familiar with the information in the passage. If they do not understand, they ask

themselves questions about the material, think aloud about where they might find the answer, and look for the answer as they read the remainder of the text. (p.3)

Data was collected on the students' strategic reading behaviors and was compared to the increase of reading comprehension skills. Results showed an increase in strategic reading behaviors for the three students involved in the study and an increase in reading comprehension skills for two of the students in the study. Benedict, Rivera, and Antia stated that "Instruction in metacognitive strategies to increase strategic reading behavior may be an effective means by which to increase reading comprehension for D/HH students" (p. 1). This strategy could be the supplemental strategy needed to be paired with the Reread-Adapt and Answer-Comprehend strategy researched by Schirmer, Schaffer, Therrien, and Schirmer (2012).

Dimling (2010) also investigated a non-visual reading strategy to help students who are Deaf or Hard of Hearing improve their reading skills through a vocabulary intervention. For six to eight weeks, six students took part in a 30 minute intervention to determine what effects vocabulary intervention would have on word recognition, production, and comprehension. Each week the students learned 12 new vocabulary words using three components: word introduction, word activities, and practice. Dimling described her findings as "The results of the present study suggest that a vocabulary intervention grounded in conceptual emphasis can substantially and positively affect students' vocabulary knowledge" (p. 444). This study suggests that vocabulary has an impact on reading comprehension for student who are deaf or hard of hearing. While Daza, Phillips-Silver, Ruiz-Cuadra, and Lopez-Lopez (2014) did not do their research on an intervention strategy, the findings from their study support Dimlings findings. Their study investigated the language skills (including vocabulary) and reading comprehension in students who were deaf or hard of hearing. They stated that vocabulary knowledge may be notably

significant in the area of developing reading comprehension (Daza, Phillips-Silver, Ruiz-Cuadra, & Lopez-Lopez, 2014). Based on both studies we can conclude that vocabulary plays a vital role in the reading comprehension skills of students who are deaf or hard of hearing.

van Staden (2013) took a different approach when researching the strategies that can be used to support reading comprehension in Deaf students. She investigated the use of a balanced literacy approach with the addition of multi-sensory coding strategies as well as reading scaffolding to increase the reading skills in a group of 64 Deaf students ranging in age of six to 11. The group was split at random and while one group received regular classroom instruction, the other group received the intervention strategies. Pre-intervention, there were no major differences in the groups' scores on the nine assessments that were administered. The intervention was conducted over a period of nine months and the post-intervention results showed that there was a large increase in reading and vocabulary skills of the deaf or hard of hearing students who participated in the balanced reading approach intervention. In comparison, the group of students who received usual classroom instruction did not exhibit the same kind of gains in their reading and vocabulary skills (van Staden, 2013). These results indicate a positive correlation between the intervention and the reading skills of the Deaf students involved in the intervention. van Staden states "The results show that following a 9-month intervention of balanced reading instruction techniques, profoundly deaf signing elementary-phase children had demonstrated a significant improvement in reading when compared to a control group who received the usual classroom instruction" as well as "the findings demonstrate that the benefits of following a whole language approach embedded in bilingualism only were marginal for the control group" (p. 314). These results indicate that in order to support Deaf students in reading and comprehension, a balanced literacy approach should be embraced in the classrooms as

opposed to a whole language, bilingual program. In contrast to the results of van Staden's study, Andrews and Rushner (2010) conducted a study on an evidence-based instructional practice in a bilingual classroom: codeswitching. They describe codeswitching as "a purpose-driven instructional technique in which the teacher strategically changes from ASL to English print for purposes of vocabulary and reading comprehension" (Andrews & Rushner, 2010, p.407). After researching multiple code-switching techniques and bilingual strategies during different areas of literacy instruction, Andrews and Rushner come to the conclusion that:

The instructional strategy of code-switching at the word, phrase, and story levels can be planned and implemented in a classroom where both languages are used to build English reading skills- vocabulary and retelling of a story and expository text segments- as these studies demonstrate. Deaf children do not have to be balanced bilinguals to participate in these intervention strategies; nor do the teachers need to be balanced bilinguals to implement them. (p. 420).

These two studies provide conflicting information. The study done by van Staden (2013) suggests that a balanced literacy approach would be a better tool for teaching students who are Deaf or Hard of Hearing, while the study conducted by Andrews and Rushner (2010) states that specific code-switching techniques used during reading instruction can support the development of literacy skills in the students who are Deaf or Hard of Hearing.

According to Monreal and Hernandez (2005) "Reading skills make children autonomous learners, and thus considerably facilitate academic and social success" (p. 379). Of the intervention strategies reviewed, the majority showed that they could be implemented with students who are deaf or hard of hearing in order to increase their reading comprehension skills. Only a few indicated that there was no significant increase in the students' reading

comprehension abilities. While many of these strategies would be difficult or expensive to implement in the classrooms, they still serve to educate teachers on the different ways they could be supporting their students in the area of reading comprehension. Further still, many of the strategies seemed designed specifically for students who are deaf or hard of hearing. Additional strategies that are often used with hearing students who are struggling readers might also benefit students who are deaf or hard of hearing. Currently, the research is either extremely limited or non-existent on the topic of newer strategies the support struggling readers, such as close reading or pre-teaching vocabulary, and their effect on the reading comprehension skills of deaf students. As Nikolarazi, Vekiri, and Easterbrooks (2013) say “One of the major challenging tasks of educators of deaf and hard of hearing students is to enhance the reading comprehension performance of their students” (p. 458). It is essential that educators stay up to date on current strategies to best support the students in their classrooms.

Factors that Affect Reading Comprehension Skills

Vocabulary and Phonology have always been sources of difficulty for students who are Deaf or Hard of Hearing. In regards to their reading comprehension abilities, vocabulary and phonology tend to be two areas that contribute to the lack of comprehension when students who are deaf or hard of hearing are reading. Daza, Philips-Silver, Ruiz, Cuadra, and Lopez-Lopez (2014) report that some studies have indicated a strong correlation between vocabulary knowledge and reading comprehension in students who are deaf or hard of hearing. An additional challenge for deaf or hard of hearing students is the way they learn vocabulary. Wauters, Van Bon, Tellings, and Van Leeuwe (2006) state that “Reading words that are thought to be learned linguistically takes longer than reading words that are thought to be learned through perception” (p. 372). Since students who are deaf or hard of hearing tend to learn their words

visually (through perception), it makes the task of acquiring vocabulary extremely difficult for them. In regards to phonology Miller (2005) states:

Factors considered central for explaining the reading process in hearing readers –such as phonemic awareness and phonological coding- have also been targeted in attempts to illuminate the origins of the impoverished reading skills of people with severe pre-lingual hearing loss. (p. 305)

Multiple studies have been conducted to determine what role phonology plays in the reading comprehension skills of students who are deaf or hard of hearing. On the topic of phonology affecting reading comprehension in students who are deaf or hard of hearing, Colin, Leybaert, Ecalle, and Magnan (2013) mention that “there is a link between language and reading achievement and consider the development of hearing-impaired children’s phonological skills to be primarily a consequence of learning to read” (p. 1791). In order to investigate this type of theory, there were a few different studies conducted. Daza, Phillips-Silver, Ruiz-Cuadra, and Lopez-Lopez (2014) researched the relationship between vocabulary knowledge and phonological awareness with reading comprehension in Deaf students. The tasks required not only decoding individual words, but the comprehension of phrases. Surprisingly, the results of the study concluded that phonological skills did not appear to be major predictors of successful reading in deaf or hard of hearing students, especially when specifically considering the literacy skill of reading comprehension (Daza, Phillips-Silver, Ruiz-Cuadra, & Lopez-Lopez, 2014). Other studies have also found inconsistencies in the role that phonology plays in regards to reading comprehension. Colin, Leybaert, Ecalle, and Magnan (2013) conducted a longitudinal study of the development of word recognition, sentence comprehension, word spelling, and

vocabulary in children with deafness. The reasoning behind their study can be explained by this statement:

Only a small number of longitudinal studies have been conducted to assess the literacy skills of children with hearing impairment. The results of these studies are inconsistent with regard to the importance of phonology in reading acquisition as is the case in studies with hearing children. (p. 1781)

The study was conducted over a three year time span and the goals were to discover if early exposure to Cued Speech (a visual system that represents words) increased phonological, reading, and sentence comprehension as well as to discover what factors other than Cued Speech might possibly have an effect on literacy performances. To the second goal of the study, the results were “inconsistent with the regard to the role of phonology and the question of whether phonological representations are predictive or are the consequences of learning to read” (Colin, Leybaert, Ecalle, & Magnan, 2013, p. 1790). Both studies came to similar conclusions, either the role of phonology was inconsistent or did not appear to play a major role in reading comprehension of students who are deaf or hard of hearing. However, Sullivan and Oakhill (2015) comment that “The word-decoding skills of DHH readers have been the focus of a number of studies because their phonological skills (i.e., phonemic awareness, phonological decoding) are considerably worse than those of their hearing peers” (p. 134). This type of statement often leads researchers to conduct studies in order to determine what role phonology plays in reading comprehension skills for students who are deaf or hard of hearing. One other study conducted by Trezek and Wang (2006) researched the implications of using a phonics based reading system with students who were deaf or hard of hearing. They used a phonics based curriculum and supplemented with Visual Phonics (a type of visual system that shows the sounds

within words). Their opinion using systems other than or addition to can be indicated by this statement: “both Cued Speech and Visual Phonics can be utilized in conjunction with a traditional sign language system to educate deaf and hard of hearing students” (p. 206). For this study specifically, they decided to supplement the phonics instruction with the visual phonics due to the fact that the teachers had recent training in visual phonics and were already utilizing it in their classrooms. To assess the students, the Wechsler Individual Achievement Test- II was used for both pre and post-tests. Results indicated that although the “students were able to receive credit for correctly matching individual words or phrases to pictures and answering questions, about sentences read, all students had difficulty answering the five comprehension questions related to a paragraph read” (p. 210). Their results align with the results of the previous two studies in that phonics did not necessarily help the comprehension skills of the students who were deaf or hard of hearing. However, Daza, Phillips-Silver, Ruiz-Cuadra, and Lopez-Lopez (2014) maintain that “low reading levels in many deaf children are due to the fact that deafness prevents access to spoken language, resulting in deficiencies in phonological processing” (p. 3526).

An additional study was conducted in regards to phonemic awareness and reading abilities in students who are deaf or hard of hearing. Izzo (2002), had two questions she wanted to answer through her research study; “(a) what is the relationship between phonemic awareness and reading abilities in students who are deaf? (b) Does phonemic awareness facilitate the reading development of these students?” (p. 18). The participants in her study were 29 severely profound deaf elementary school students, 14 boys and 15 girls, who attended residential schools for the deaf mainly communicated using American Sign Language. In the area of phonemic awareness, the group had scores ranging from 2-17 (on a scale of 0-24), meaning they scored

anywhere from very low to moderately high. It is worth noting that those results arguably differed from those of the reading and language scores during the study. The results of this study showed that while reading ability was not necessarily tied to phonemic awareness, it did have a connection to language ability. These results are consistent with those of (Daza, Phillips-Silver, Ruiz-Cuadra, & Lopez-Lopez, 2014) and of Colin, Leybaert, Ecalle, and Magnan (2013). Even though multiple researchers have tried to tie phonemic awareness to reading comprehension skills in deaf or hard of hearing students, the literature shows that currently, no one has proved that to be true. In her closing remarks, Izzo (2002) mentions that “There was not a significant correlation between these two variables, which suggested that phonemic awareness may not play a vital role in the reading development of students who are deaf” (p. 27).

According to Kunisue, Fukushima, Kawasaki, Maeda, Nagayasu, Kataoka, Kariya, Fukutomi, Takami, and Nishizaki (2007), “The ability to comprehend abstract words and ideas are essential in the development of academic language skills for hearing impaired children” (p. 1672). Abstract, multi-meaning words, and figurative language are especially difficult for students who are deaf or hard of hearing to understand. This theory can be supported by Aceti and Wang (2010) who stated that a majority of vocabulary deficiency in students who are deaf or hard of hearing comes from their limited access to multi-meaning words. Typically, this lack of vocabulary is considered by many educators to be at least a portion of the problem when it comes to the comprehension of sentences or passages read by students who are deaf or hard of hearing. “Because the acquisition of this abstract vocabulary plays an important role in development of their learning skills, comprehension of abstract words is essential for education in school-aged children” (Kunisue, et. al, 2007, p. 1672). To explore this topic, they conducted a study to examine the ability of students who were deaf or hard of hearing to comprehend abstract

words. There were 75 Deaf students who participated in the study, 61 of which used hearing aids and 14 who were using cochlear implants. There were also 188 hearing students who participated as a control group. Using a Picture vocabulary test and The Standardized Comprehension Test for Abstract Words, they studied the results of the hearing impaired children and hearing children involved in the study. Once the study was complete, Kunisue, et. al (2007) reported that “Although a quantitative in vocabulary was apparent, the qualitative aspect of language development did not differ between hearing impaired children and their hearing peers.” (p. 1677). In other words, the results of their study did not indicate a strong difference between the abilities of the deaf or hard of hearing students and the hearing students. Aceti and Wang (2010) did a similar study, but focused on using direct instruction of multi-meaning words with students who were deaf or hard of hearing. The study was conducted over the course of eight weeks and included four students, ages 11 to 13, who were struggling readers and had been placed together because of their severe language delays. In order to test their theory, they used the same pre and post-tests consisting of two parts, a multiple choice test and a video recording of the students signing 20 sentences. On the post test, each student scored 100% accuracy within section one. For the second part of the test, students showed at least 22.5% increase. The researchers also observed that students were using strategies such as self-correction and reading a head silently before they signed the sentences. These results indicate that this strategy is useful for teaching multi-meaning words and could support reading comprehension. Miller (2005) states that:

One possible reason for the persistence of the reading deficits of individuals with severe pre-lingual hearing loss is a dearth of knowledge of the world; another is insufficient

development of metacognitive skills (e.g., the ability to infer information that is not explicitly stated in a text or the ability to understand figurative language). (p. 307)

Many times figurative language confuses students who are hearing and more often it confuses students who are second language learners. It is especially confusing for students who are deaf or hard of hearing. Giang and Inho (2015) conducted research with 215 hearing impaired students and 557 hearing students in Vietnam to determine what the comprehension of figurative language was for students who were deaf or hard of hearing. For the study, they used figurative language tests they had developed using idioms and proverbs found in the Vietnamese language textbooks for children. Their report in the results is as follows:

Our results show that the figurative language knowledge of hearing impaired children to be much poorer than that of hearing children. Furthermore hearing impaired children not only had lower figurative language knowledge than that of grade-matched hearing children, but also hearing children in lower grades. The poor performance of hearing impaired children on figurative language of this study corresponds to the results of other studies. (p. 509).

This study by Giang and Inho (2015) indicates yet another area of language that students who are Deaf or Hard of Hearing struggle with, in addition to abstract words and multi-meaning words. Based on the literature, vocabulary (sight words, abstract words, multi-meaning words, and figurative language) is definitely an area that impacts the reading comprehension of students who are deaf and hard of hearing.

In 2003, Wauters, Tellings, Van Bon, and Van Haaften introduced mode of acquisition; which “refers to the way in which children or adults acquire the meanings of words” (Wauters, Van Bon, Tellings, & Van Leeuwe, 2006, pp. 371-372). In order to discover whether specific

characteristics cause reading comprehension tests to be more difficult for Deaf students, Wauters, Van Bon, Tellings, and Van Leeuwe conducted research using data collected from almost 13,000 hearing students ages seven to 12 and 253 Deaf students ages seven to 20 years old. Once the data was compiled results showed that:

MOA- referring to the type of information (perceptual, linguistic, or both) used in word meaning acquisition- was the only factor that contributed significantly to deaf and hearing children's reading comprehension. For hearing children, MOA influenced item scores at the third- and fourth-grade levels. For deaf children, MOA influenced item scored through the sixth-grade level. (p. 371)

For students who are deaf or hard of hearing, there are multiple ways for them to acquire the meanings of words. The main methods that are typically used are Sign Language, Cued Speech, and Visual Phonics. Each of these systems has a different way of conveying messages and meanings of words. As stated by Trezek and Wang (2006) "both Cued Speech and Visual Phonics can be utilized in conjunction with a traditional sign language system to educate deaf and hard-of-hearing students" (p. 206). Another study conducted by Wauters, Tellings, van Bon, and Mak (2008) explored mode of acquisition as a factor in reading comprehension for students who are deaf or hard of hearing. They worked with 72 deaf students and 99 hearing students, ages seven to 14 years old, to complete two testing sessions with a two week interval. The results of the post assessments were exactly how they predicted they would be. For both the hearing and the deaf or hard of hearing students, "we expected longer reading times in the self-paced reading tasks for items with a word that is judged to be learned perceptually and, indeed found this effect" (p.188).

On areas in which deaf and hard of hearing students struggle, Friedmann and Szterman (2001) note that “Hearing loss during the critical period for language acquisition restricts spoken language input. This input limitation, in turn, may hamper syntactic development” (p. 212).

Their research indicated that an additional area in which students who are deaf and hard of hearing struggle is the syntax of the English language. Miller (2005) explains that:

Deficiency in another area, syntactic knowledge, may be more likely to blame. Syntactic knowledge reflects an understanding of how the meaning of single words is specified by their temporal structuring within a sentence. The acquisition of such structural knowledge is assumed to result from repeated exposure to a speech act uttered in relation to a concrete experienced action or event. (p. 307)

Not only is the lack of syntactical knowledge to blame for the reading comprehension deficiencies in students who are deaf or hard of hearing, but also vocabulary and word identification, among others. Kelly and Berent (2011) conducted a study to test the semantic and pragmatic factors that influence the reading comprehension of English sentences by students who are deaf or hard of hearing. Their study included 305 students, broken down into seven different groups, deaf middle school, deaf high school, deaf associate’s program, deaf bachelor’s program, hearing middle school, hearing high school, and hearing bachelor’s program. The results of their study was noted as “under conditions of severely restricted access to spoken language input, deaf learners have a greater interpretive access to sentences exhibiting greater derivational economy and less access to sentences exhibiting less derivational economy (i.e., greater derivational complexity)” (p. 434). In any event, the deaf participants were less competent than their hearing counterparts. This study shows that semantics does in fact play a role in reading comprehension for students who are deaf or hard of hearing. In addition to the results of the previous studies,

and speaking to the challenges facing students who are deaf or hard of hearing, Nikolarazi, Vekiri, and Easterbrooks (2013) make mention that “Furthermore, these challenges are associated with many variables, namely the text (e.g., word identification and syntax), the reader (e.g., prior knowledge, metacognition) and the context (e.g., the purpose of reading) (p. 458).

Vocabulary knowledge, phonology, mode of acquisition, and syntactical knowledge all play a role in the comprehension skills of students who are deaf or hard of hearing. Based on the literature, the mode of acquisition and vocabulary knowledge tend to play larger roles than that of phonology. Through this review, phonology has actually shown to have almost no link to reading comprehension skills among students who are deaf or hard of hearing. In addition to mode of acquisition and vocabulary knowledge, syntactic knowledge has also been shown to play a significant role in the comprehension skills of students who are deaf or hard of hearing, similar to students who are second language learners. Kelly and Berent (2011) note that “The English languages challenges confronting deaf students can be attributed to the fact that, for a large majority of deaf learners, their English acquisition is arguably second language (L2) acquisition in the absence of a fully intact spoken first language (L1)” (p. 419). Where hearing children (who are not second language learners) typically have the opportunities to acquire vocabulary and syntax from an early age through incidental learning, students who are deaf and hard of hearing do not have the same choices. The results of the studies in this section of the review indicate that there are many different factors that can influence the reading comprehension skills of students who are deaf or hard of hearing.

Deaf vs. Hard of Hearing vs. Cochlear Implants

Not every deaf child is completely lacking hearing abilities. There are sub groups of deaf students who are classified as hard of hearing (some with hearing aids and some without) as well

as a group of students who have had surgery to get one or two cochlear implants. Because of the range of hearing abilities in deaf students, it is often necessary to compare and contrast their reading abilities as well as which strategies work for which groups. In regards to deaf students, Miller (2005) states:

One possible reason for the persistence of the reading deficits of individuals with severe pre-lingual hearing loss is a dearth of knowledge of the world; another is insufficient development of metacognitive skills (e.g., the ability to transfer information that is not explicitly stated in a text or the ability to understand figurative language. (p. 307)

In other words, Deaf students tend to lack background knowledge and are lacking in inference skills as well as the skills needed to understand figurative language. The absence of these skills goes back to what Mich, Pianta, and Mana (2013) stated “Deaf children have significant difficulties in comprehending written text. This is mainly due to the hearing loss that prevents them from being exposed to oral language when they were an infant” (p. 34).

On the subject of Deaf students who have cochlear implants, Lopez-Higes, Gallego, Martin-Aragoneses, and Melle (2015) state that: “Children with severe to profound deafness can reach a true functional hearing level with the CI and can recognize familiar words and phrases without contextual aid. However, their hearing is not completely normal” (p. 136). Since they would have access to more oral language than a pre-lingual deaf child, one would assume they have a higher chance of developing age appropriate reading abilities. Vermeulen, van Bon, Schreuder, Knoors, and Snik state that “one expectation of CIs is that they might enhance the reading comprehension of deaf children” (p. 283). However, hearing students are still likely to outperform students who are deaf or hard of hearing with cochlear implants in reading

assessments. This gap of achievement is due to the fact that child with a CI doesn't have full hearing abilities, as noted by Lopez-Higes, Gallego, Martin-Aragoneses, and Melle (2015).

Apel and Masterson (2015) conducted a study to determine the spelling and reading abilities of students who have cochlear implants compared to students with normal hearing. The results indicated that the students with cochlear implants had poorer spelling skills and lower scores for the comprehension assessments. They determined that some of the mistakes made during the spelling tasks were due to a lack of phonemic awareness as well as "limitations in their knowledge of spelling patterns for base word and morphological elements" (p. 132). Other studies have also been conducted regarding the difference of abilities between deaf or hard of hearing students with cochlear implants and hearing students. Vermeulen, van Bon, Schreuder, Knoors, and Snick (2007) organized a study focusing on students who have cochlear implants compared to students with normal hearing abilities, but they also included a group of Deaf students without cochlear implants. In their abstract, the authors stated that: "The reading comprehension level in the children with CIs was expected to surpass that in deaf children without implants, partially via improved visual word recognition" (Vermeulen, van Bon, Schreuder, Knoors, & Snick, 2007, p. 283). Results of this study indicated that while the students with cochlear implants had higher reading scores than those students without implants, they were still far below grade level compared to the group of hearing students. These two studies yielded similar results, proving that students with normal hearing tend to have high scores and outperform the students who are Deaf or hard of Hearing.

Unlike Apel and Masterson (2015) and Vermeulen, van Bon, Schreuder, Knoors, and Snick (2007), Miller (2005) had mixed results when comparing the performance of hearing students with a group of Deaf students and a group of Hard of Hearing students. Miller's study

was an attempt to compare and contrast the reading skills of students with different hearing abilities: Deaf, Hard of Hearing, and hearing. He used their performance of two word processing tasks as well as a sentence comprehension test. His hypothesis essentially stated that “better hearing would be associated with better word processing abilities as well as with superior sentence comprehension, and vice versa” (p. 307). When the results were evaluated, the hypothesis was not fully supported. When using sentences that were semantically implausible, the hearing students performed much better than the Deaf or Hard of Hearing groups. However, while the hearing group was superior to the Hard of Hearing group when given semantically plausible sentences, the Deaf group outperformed the hearing group. There was also no significant difference between the Deaf group and Hard of Hearing group during either sentence comprehension task. To succinctly explain the entire findings of his study, Miller states:

In sum, findings from the present study show that the seriously impoverished reading skills that characterize individuals with severe pre-lingual hearing loss as a group reflect the reliance on reading strategies that are based on insufficient or deviant structural knowledge regarding the spoken code, rather than a failure to efficiently process written words at the lexical level. (p. 319)

These results are slightly contradictory when considering the results of the study conducted by Apel and Masterson (2015) and Vermeulen, van Bon, Schreuder, Knoors, and Snick (2007).

Lopez-Higes, Gallego, Martin-Aragoneses, and Melle (2015) conducted a unique study comparing two groups of students with cochlear implants to explore their morpho-syntactic reading comprehension. One group had the implant surgery prior to turning two years old, where the second group received implants after 24 months of age. These students were also compared to a hearing controlled group. The thesis was that “the earlier the CI is received the

better the results would be (Lopez-Higes, Gallego, Martin-Aragoneses, and Melle, 2015, p. 137). Results showed that students who received their cochlear implants before turning two performed just as well as the hearing group. However, the group who received cochlear implants later made many more mistakes and had much lower scores than that of the hearing group and the early cochlear implant group. To this point Lopez-Higes, Gallego, Martin-Aragoneses, and Melle state:

From our perspective, the age of implantation should be considered as a construct, and should be interpreted as such. Because of its technical and social nature, factors like: the age of the first hearing device, the status of the current hearing aids, etiology, the socioeconomic status, new advances in technology or in surgery, among others, are necessarily implied. (p. 143)

The results of this study contradict the results of the studies previously mentioned by Apel and Masterson (2015) and Vermeulen, van Bon, Schreuder, Knoors, and Snick (2007) where the students with cochlear implants were still lagging behind their hearing peers.

Friedmann and Szterman (2010) conducted a unique study with Deaf students who either wore hearing aids or cochlear implants to “examine the comprehension, production, and repetition of WH- questions in deaf or hard-of-hearing (DHH) children” (p. 212). The participants consisted of 11 Hebrew children who were orally trained, ranging in ages from nine to 12 years old. Two different experiments were done, one on the comprehension of WH questions and one on the production of WH questions. While there were multiple findings throughout the study, overall the results can be narrowed down to Friedmann and Szterman’s statement that “Our results demonstrate that DHH children have a notable difficulty in structures derived by WH-movement without embedding: They showed impaired comprehension,

production, and repetition of WH-questions, and impaired repetition of topicalization sentences” (p. 227).

While the studies do show that students who are deaf, but have cochlear implants or are hard of hearing and use assistive devices (such as hearing aids) often outperform their deaf counterparts who have no assistive technology, they are still lagging behind their hearing peers. Thus, the strategies that have been researched should be implemented with all students who are deaf or hard of hearing, whether they have assistive devices or not, so that there is a possibility of obtaining age appropriate literacy skills.

Method

Context

This study took place at a private preschool through 12th grade residential school for the Deaf in New York. At the elementary level there are two classes for kindergarten, one class per grade 1-5, and a modified 3rd-5th classroom. In middle school and high school the students rotate classes which includes math, science, ELA, and social studies. There is also a modified mixed middle school classroom and a life skills program for high school students.

111 students attend this school with ages ranging from 18 months to 21 years old. Of the 111 students, 63 are boys and 48 are girls. Every student who attends this school is Deaf, a small percentage also have additional disabilities that impact their learning. Based on the data retrieved from student IEP's and Social History Reporting, the ethnic makeup of the 111 students is as follows: Asian- 4 (3.61%), African American- 9 (8.11%), Hispanic- 23 (20.72%), Caucasian- 70 (63.06%), Bi-Racial- 5 (4.50%). Out of the 111 students, 36 day students receive free lunches. The 16 dorm students also receive free meals, but that is automatically part of

living on campus so their economic status is not documented. Three of the students receive reduced lunches. This represents 54% of the student population (51% Free and 3% Reduced).

This school has a bilingual-bicultural philosophy and supports the use of balanced literacy within the classrooms. Programs are implemented throughout the school for positive behavior and most of the students are active in multiple sports programs. Given that this school is specialized and private, the students who attend live in multiple communities surrounding the area in which the school is located as well as in the immediate area.

The school employs 24 classroom teachers and 14 resource teachers. Resource teachers include speech therapists, physical education teachers, a librarian, an art teacher, and a music teacher. The school also has faculty for services for the students including a physical therapist, an occupational therapist, a vocational evaluator, an educational evaluator, a school counselor, a few guidance counselors, two school psychologists, a behavior management specialist, and an audiologist. In addition to the above faculty and staff, the school has 22 teaching assistants. The teachers employed by this school all hold masters degrees or are working toward them. Their New York State certifications are in deaf education and either elementary education, special education, or a secondary content area.

Participants

Teachers.

A portion of this study includes teachers from the school. Four specific teachers were asked to participate in a focus group to discuss comprehension strategies they have used successfully with the previous students.

The second grade teacher, Jackie, has been teaching at the school for 14 years. She has a bachelor's degree in Speech and a master's degree in Literacy. In addition to holding the New

York certifications for the areas of her degrees, she also has New York certification in Deaf Education. During her time at the school, she has taught at multiple grade levels.

The ELA specialist, Carrie, has been working at the school in various roles for 12 years. Currently, she works with teachers a literacy leader and does push-in speech sessions with a few students. She also teaches mini lessons or co-teaches in some of the classrooms from time to time.

The fourth grade teacher, Susan, has been teaching at the school for three years. Her first year was as a long term substitute and the last two years she taught fourth grade. She holds a bachelor's degree in Visual Media and a master's degree in ASL-English Bilingual Education. Her New York state certification is in Deaf Education.

The middle school ELA teacher, Kate, has been working at the school for 16 years and previously taught at a different school for three years. She holds a bachelor's degree and New York certification for Speech Pathology and Audiology as well as a master's degree and New York certification for Deaf Education.

In addition to the focus group, I asked all teachers from 1st grade through high school to complete a questionnaire about comprehension strategies they have used successfully with the previous students. Four teachers returned the questionnaire to me by the given deadline, one of which was the ELA specialist mentioned above.

Maggie works with high school students and has been teaching for 13 years. Her bachelor's degree is in Special Education while her master's degree is in Deaf Education. She currently holds New York State certification for Deaf Education (K-12) and Special Education (K-12).

Penelope currently works with middle school and high school students and has been teaching for 34 years. Her bachelor's degree is in Deaf Education and her master's degree is in Secondary Education. She holds New York State certification for both Deaf Education (K-12) and Special Education (K-12).

Logan is the 3rd grade teacher and has been teaching for 27 years. She a bachelor's degree in Elementary Education and Special Education. Her master's degree is in Deaf Education. Logan currently holds New York State certification in Elementary Education (1-6), Special Education (K-12), and Deaf Education (K-12).

Students.

Within my own classroom, I worked with three students for this study. All three students are 10 year old, Caucasian, boys. Their names are as follows: James, Peter, and Cory.

James uses a cochlear implant as an assistive device and comes from a hearing family. His current F&P assessment results revealed that his instructional reading level is R. These results indicate that he is slightly below grade level. He loves to read graphic novels, fantasy books, and humor books. His favorite color is green and he enjoys playing soccer and volleyball. James receives speech services three times a week, one of which is done in the classroom by the ELA specialist.

Peter uses two hearing aids to increase his hearing levels and also comes from a hearing family. He is also very vocal, with near perfect speech. His most recent F&P assessment showed his instructions reading level to be at level U, meaning Peter is current reading slightly above grade level. He receives speech services out of the classroom twice a week and attends a group counseling session that encourages social skills once a week. His favorite books are the

Goosebumps series and Diary of a Wimpy Kid. Peter's favorite color is pink and he enjoys playing soccer.

Cory is both profoundly deaf, with no assistive devices, and is from a deaf family. His most recent F&P assessment results indicate that he is reading at level Q for instructional reading, placing him one grade below his current grade. He tends to favor humorous or scary books when reading. Cory receives speech services out of the classroom three times a week and attends a group counseling session that encourages social skills once a week with Peter. His favorite color is green and he enjoys playing soccer.

Researcher Stance

I am currently attending St. John Fisher College as a graduate student in the Birth-12th Grade Literacy Program. I have received a Bachelors in Arts degree from Flagler College in St. Augustine, Florida for Deaf Education and Elementary Education. I currently hold New York state certification for Deaf Education (K-12) and Elementary Education (1-6). Mills (2014) states that teachers "are active participant observers of their own teaching practice" (p. 85). While collecting data for this study, I worked with students in my own classroom as an active participant observer. When teachers are actively involved in their teaching, they see the results of that teaching (Mills, 2014). I worked in small groups to implement comprehension strategies with my students and noted the outcomes of those interventions. I also lead a focus group with a few teachers to discuss comprehension strategies they have successfully used with their students, In addition to the focus group, I distributed questionnaires to additional teachers on the same topic. Lastly, the students completed questionnaires regarding what comprehension strategies have worked for them in the past.

Method

For this study I collected qualitative and quantitative data in order to discover what strategies teachers use to successfully support reading comprehension skills in students who are Deaf or Hard of Hearing. Working with the four students in my classroom, I collected field notes during three different intervention strategies as well as pre-tests and post-test scores. The strategies I implemented with the students were: Re-reading, Pre-Teaching Vocabulary, and Using American Sign Language to convey a story in place of students reading for themselves.

The re-reading strategy was tested by giving the students a running reading record assessment which included reading comprehension questions at the end. The students would read their passage the first time, while I marked miscues on a running record sheet and would answer the comprehension questions once they were finished reading. Students then read the passage for a second and third time before answering the comprehension questions again. The purpose of this strategy was to determine if re-reading the passages aided their reading comprehension skills.

Pre-teaching vocabulary was also tested by giving students a running reading record assessment. Only in this intervention, one assessment was given to be read silently and comprehension question answered after the first reading. A second different passage (at the same reading level and in the same genre) was given to the student. I would teach specific vocabulary words within that passage before the students read the passage and answered the comprehension questions. The purpose of this intervention was to determine if pre-teaching important vocabulary words would support the comprehension of the entire text.

For the third intervention, I gave the students a story to read to themselves and comprehension questions to answer. I then signed a different story (same text level and genre) using American Sign Language and signed the reading comprehension questions for the students.

The purpose of that intervention was to see if delivering a text and questions in the students' first language had any bearing on their reading comprehension skills.

I also collected field notes during a focus group I hosted with four of the teachers at the school. During the focus group I provided questions (Appendix A) for the teachers in order to lead a discussion regarding what type of reading comprehension strategies they have found to be successful for students who are Deaf or Hard of Hearing.

In addition to the focus group, I sent out a questionnaire (Appendix B) to multiple teachers throughout the school in order to discover what comprehension strategies they have used successfully in the past with their students who are Deaf or Hard of Hearing. This questionnaire had a selection of specific reading strategies to choose from, as well as a section for them to add in a strategy.

Lastly, I provided my students with a questionnaire (Appendix C) to inquire which kinds of strategies have worked for them in the past. This questionnaire was a more simplified version of the one given to faculty and staff, but still included multiple strategies for them to select from.

Quality and Credibility Research

Throughout this study, it was important to ensure the quality and credibility of the data gathered. Mills (2014) focuses on the writing of Guba (1981) to address the issue of trustworthiness in action research through the characteristics of credibility, transferability, dependability, and confirmability. During the study, I have strived to maintain flexibility and adaptability while implementing strategies and collecting data.

Credibility can be defined as "the researcher's ability to take into account the complexities that present themselves in a study and to deal with patterns that are not easily

explained” (Mills, 2014, p. 115). In order to ensure credibility throughout this study, I collected data through various means and multiple sources. Guba (1981) suggests that researchers collect videos, artifacts, and documents to ensure credibility. Through my field notes, student artifacts, video recordings, and questionnaires, I was able to meet the criteria for a credible study.

The second criterion for active research is transferability. Guba (1981) describes transferability as “qualitative researchers’ beliefs that everything they study is context bound and that the goal of their work is not to develop “truth” statements that can be generalized to larger groups of people” (Mills, 2014, p. 116). In order to establish transferability in my study, I took detailed field notes and referred to the video recordings to ensure accurate data was collected.

I also used multiple methods in my data collection to meet the criteria of a dependable study. Dependability is defined by Guba (1981) as “the stability of the data” (Mills, 2014, p. 116). By having overlapping methods of field notes, video recording, student artifacts, and questionnaires, I was able to provide dependable data.

Lastly, I used multiple methods to ensure triangulation and establish confirmability in this study. With the above criteria, I was able to guarantee the quality of the research while also establishing trustworthiness and validity. By ensuring the credibility, transferability, dependability, and confirmability, this study can be considered valid.

Informed Consent and Protecting the Rights of Participants

For the purpose of protecting the rights of the participants, all the names used in this study have been replaced with pseudonyms. In addition to using pseudonyms, any artifacts collected during the course of the study are void of any identifying marks. Each student under the age of 18 has a permission form signed by their parent or legal guardian in addition to the assent forms signed by themselves. Each adult participant in this study has a signed consent

form. These forms ensure that all participants were made aware of the aspects of the study, including risks and benefits. Along with each form, participants were provided with an explanation of the study, as well as my contact information should they wish to withdraw from the study or see the results.

Data Collection

In order to collect data in this study that will provide multiple, accurate results, I will use the following: active observation field notes, student artifacts, field notes from a focus group, and two questionnaires: one for faculty and staff and one for students. The active observation field notes were taken before, during, and after the three intervention strategies used with the students. The sessions were also video and audio recorded so that I have an accurate transcription of what occurred during the sessions. An iPad was used for all video and audio recordings.

Student artifacts were also collected from the intervention strategies. I provided each of the students with pre-tests and post-tests to determine the effect of the strategy implemented each during each session. This provided me with a total of nine pre-tests and nine post-tests all together.

During the focus group with the four teachers, I collected field notes that reflected the conversation around the topic of comprehension strategies used with students who are deaf or hard of hearing. I provided multiple questions (Appendix A) to the teachers to facilitate the conversation. In order to ensure accurate transcription of this conversation, the focus group was also video and audio recorded with the iPad.

Questionnaires regarding specific comprehension strategies used with students who are Deaf or Hard of Hearing were also sent out to multiple teachers in the school building as

additional way to collect data. The questionnaire lists a variety of strategies that support reading comprehension. For each strategy, the teachers were asked whether or not they had used the strategy and if it was successful. There was also additional space added to answer the question: why or why wasn't the strategy successful. The results of these questionnaires are reported in a quantitative manner.

Lastly, I provided my students with a questionnaire (Appendix C) to inquire which kinds of strategies have worked for them in the past. This questionnaire is a more simplified version of the one given to faculty and staff. The students marked a box with a check mark to indicate if they had used a listed strategy and marked a second box with a star if that strategy helped them understand what they were reading. Additional space was added under each strategy for the students to answer the question: Why or why didn't this strategy work for you?

Data Analysis

During the course of this study, several different forms of data were collected. In order to discuss the findings of my research, I needed to conduct an in depth analysis of this data. The first set of data I analyzed was from a focus group that consisted of four teachers of the deaf. The first step I took to analyze the focus group discussion was to review my field notes to look for similarities and differences in the answers to the discussion questions. I analyzed the notes by highlighting the similarities throughout my notes for each question. I then reviewed the video recording to make sure I was not missing any important information. I was not able to find any additional information from the video recording compared to my notes, but the information gained by highlighting the similarities enabled me to determine some strategies that are successful with students who are deaf or hard of hearing.

The next piece of data I analyzed was the questionnaires I sent out to teachers with in the school building. Using a highlighter and a chart with tally marks, I recorded all of the similarities I found throughout the questionnaires. The highlighting was used for the short answer responses and the chart with the tall marks was used for the questions that only required a yes or no response. By analyzing the data in this manner, I was able to note the similarities and differences between the answers provided by the teachers. I was then able to use that information to determine which strategies were most often used in classrooms with deaf or hard of hearing students and, which strategies were successful and which were not, and why those strategies did or did not work for those students.

The third set of data analyzed was also a questionnaire, but they were completed by a group of three students who are deaf or hard of hearing. Similar to how I analyzed the teacher questionnaires, I used highlighting to note similarities in the students short responses and a chart with tallies to note the similarities between the questions that had yes or no responses. After analyzing the data this way, I was able to determine what strategies the students had used in the past, which ones were or were not successful, and why they did or did not work for the students.

The final set of data I collected and analyzed was three sets of pre-tests and post-tests from the students. This set of data was analyzed by using a chart to record the pre-test and post-test scores of each strategy for each student. Based on the documented information, I was able to determine which strategies successfully increased the student's scores and therefore were successful in supporting their reading comprehension.

Taking the time to analyze each piece of data was important process. Using the data from questionnaires, focus groups, and pre-tests and post-tests, I was able to figure out which

strategies help to support the reading comprehension skills of students who are deaf or hard of hearing. By using multiple tools to analyze and code my data, I was able to determine the three themes that will be discussed in the findings section of this paper.

Findings and Discussion

Multiple forms of data were collected throughout this action research, both qualitative and quantitative. The research can be sorted into the following three categories: field notes from video recordings, teacher and student questionnaires, and student work. After looking through the data multiple times, three strong themes emerged. The first theme that I noticed was common strategies that were successful in supporting reading comprehension in students who were deaf or hard of hearing. These strategies are the ones teachers use regularly in classrooms with typical students as well as struggling readers. The next theme that emerged was strategies that were successful in supporting reading comprehension in students who were deaf or hard of hearing that you would not normally see in a typical classroom. Those strategies were tailored to meet the needs of a deaf or hard of hearing student or even an English Language Learner. The third theme that was evident within the data collected was strategies that were not successful in supporting the reading comprehension of students who are deaf or hard of hearing.

Common Strategies that Support Reading Comprehension for Students Who are Deaf or Hard of Hearing

Within the data collected for this study, both students and teachers indicated multiple common strategies that support reading comprehension in students who are deaf or hard of hearing. In student questionnaires (Appendix B), each student indicated that they had used every strategy listed, except for one, and that they were all helpful in regards to their comprehension of

the text (Table 1). The one strategy they did not mark is something they have not yet used, Close Reading. However, specifically in the teacher questionnaires (Appendix A), not all the same strategies were successful with the students and the reasons they strategies were or were not successful varied (Table 2).

Table 1

Student Questionnaire

Staff	Close Reading	Story Maps	Venn-Diagrams	Summarizing	Adding Pictures to text	Re-Reading the Story
James		✓ ☆	✓ ☆	✓ ☆	✓ ☆	✓ ☆
Peter		✓ ☆	✓ ☆	✓ ☆	✓ ☆	✓ ☆
Cory		✓ ☆	✓ ☆	✓ ☆	✓ ☆	✓ ☆
✓ Used Strategy		☆ Strategy was helpful				

Table 2

Teacher Questionnaire

Teacher	Close Reading	Story Maps	Venn-Diagrams	Summarizing	Adding Pictures to text	Re-Reading the Story
Maggie	✓ ☆	✓ ☆		✓	✓ ☆	✓ ☆
Penelope	✓ ☆	✓ ☆	✓ ☆	✓	✓ ☆	✓ ☆
Carrie	✓ ☆	✓ ☆	✓ ☆	✓ ☆	✓ ☆	✓
Logan	✓ ☆		✓ ☆	✓ ☆	✓ ☆	✓ ☆
✓ Used Strategy		☆ Strategy was successful				

The questionnaires asked both teachers and students to indicate which strategies listed on the survey they had used to support reading comprehension, which ones were successful, and why they thought that strategy worked. On both sets of questionnaires, many of the strategies were marked as having been used to support reading comprehension and most of the time it was indicated that they were successful. For example, 100% of the teachers indicated that they had used Re-reading the Text with their students and 75% of those teachers indicated that it was successful. This data indicates that re-reading is a strategy that teachers typically use with students who are deaf or hard of hearing and that it is often successful. Re-reading being a successful strategy for students who are deaf or hard of hearing is also supported by the study conducted by Schirmer, Schaffer, and Schirmer (2012). One teacher commented that re-reading “helps students pick up on details or information they missed the first time. They can also re-read for specific info that I want them to learn (matched to my objective)” (Teacher Questionnaire, 2015). This teacher response indicates that students benefit from re-reading in multiple settings. All of the students also indicated that Re-reading the Text increased their reading comprehension skills. One student wrote “If I don’t know, I go back and find out” (Student Survey, 2015). This student response proves that students are using this strategy and are finding it helpful when they need to answer comprehension questions about a text. As part of the research process, I used three different strategies with the students and gave them pre-tests and post-tests to measure the effectiveness of the strategies. One of those strategies tested was Re-reading the Text. Table 3 below provides the pre-test and post test scores of the students.

Table 3

Student Work: Re-Reading Strategy

<u>Student Name</u>	<u>Pre-Test Score</u>	<u>Post-Test Score</u>
James	60%	80%
Peter	60%	60%
Cory	60%	80%

These scores indicate that re-reading can be an effective strategy since it helped improve the overall scores for both James and Cory. By using the re-reading strategy, James and Cory both increased their scores from 60% to 80%. My findings differ from those of Schirmer, Schaffer, and Schirmer (2012), where the students they worked with needed to add a comprehension monitoring strategy to help increase their comprehension scores after re-reading. Peter actually marked the answers opposite on his post-test from his pre-test for numbers 1-4, only correctly answering number 5 right both times. I believe that these changes in his answers indicate that he was second guessing his original answers, but that re-reading helped him answer his incorrect answers right the second time.

While none of the students selected Close Reading as a strategy they used on their questionnaires, 75% of the teachers indicated that they used in it their classrooms with students who were deaf or hard of hearing (Table 2). Those teachers that did mark Close Reading also indicated it was a strategy that successfully supported the reading comprehension of their students. One teacher commented that “I like using this with all students 3rd-12th grade for practice with attacking passages that may be beyond their reading level” (Teacher Questionnaire, 2015). While this teacher comment indicates that Close Reading is used with a large population

of students in the school, the students who completed the student survey noted that they have not used Close Reading yet. The student responses could be due to the teachers that they have had in the past not using the strategy in their classroom. It is also important to mention, that most of the teachers who completed the teacher questionnaire taught in the middle or high school area of the school and that during the literature review, I did not find any body of work that supported the use of Close Reading specifically with students who are deaf or hard of hearing. Table 4 shows additional strategies that were successfully used by the majority of the teachers and students.

Table 4

Teacher and Student Responses

Strategy	Student Usage	Students who found the strategy helpful	Teacher Usage	Teachers who found the strategy successful
Story Maps	100%	100%	75%	100%
Venn-Diagrams	100%	100%	75%	100%
Summarizing	100%	100%	100%	50%*

*One teacher selected yes and no, the percentage reflects only those teachers who selected yes

The above data (Table 4) lends itself to some useful information. While the students indicated that they used all of the strategies, only 75% of the teachers reported using Story Maps and Venn-Diagrams. The difference in responses could be due to which teachers the students have had while at the school. The teachers who did report using Story Maps and Venn-Diagrams all indicated that they were successful in supporting the reading comprehension of students who are deaf or hard of hearing. For the Summarizing strategy, both students and teachers all

indicated that it was something they used in the classrooms. However, one teacher reported that the strategy was not successful while another chose yes and no when asked if the strategy worked for students who were deaf or hard of hearing.

In addition to having strategies to select from, teachers had space on their questionnaires to list additional strategies they use with students in their classrooms that successfully support their reading comprehension of a given text. Table 5 lists the specific strategies the teachers added and the percentage of the teachers using that strategy.

Table 5

Teacher Questionnaire Responses

Strategy Listed	Usage by Teachers
Guided Reading	50%
Shared Reading	25%
Pre-Teaching Vocabulary	50%
Build Background Knowledge	25%
Make Text Connections	25%

While none of the research I discovered during the literature review mentioned using the strategies listed in the above table (table 5), I felt that it was important to include the information the teachers provided me with on their questionnaires. In the last section of the questionnaire, I

asked the teachers to add any additional reading comprehension strategies they found to be successful with students who are deaf or hard of hearing. The above table lists those strategies. The two most common mentioned strategies were pre-teaching vocabulary and using guided reading in the classroom. This data leads me to believe that at least half of the teachers at this school use these two strategies to support their student's reading comprehension. The other strategies listed are not as commonly used in this school, but could be successful if more teachers used them in their classrooms.

During the focus group session, the teachers that participated provided me with some feedback as to which common reading strategies they used successfully with their students. Many of them mentioned some of the same ones that teachers listed additionally in their questionnaires, or that were already listed on the questionnaires, such as: building background knowledge, pre-teaching vocabulary, making connections, and Close Reading. Some additional strategies they mentioned were using word walls (in both ASL and English), using post-its in the text, QAR, and chunking the text.

Another strategy that I tested with the students and collected pre-tests and post-tests for was pre-teaching vocabulary. I provided students with an instructional level text as a pre-test and had them independently read and respond to the comprehension questions. I then did a mini lesson on important vocabulary for an additional instructional level text (within the same genre) before giving the student the passage and questions. Below, in Table 4, I have documented the scores of those pre-tests and post-tests.

Table 6

Student Work: Pre-Teaching Vocabulary Strategy

Student Name	Pre-Test Score	Post-Test Score
James	60%	40%
Peter	60%	60%
Cory	0%	80%

These scores indicate that pre-teaching the vocabulary in these passages was an effective strategy for Cory, but not for James. While Cory increased his score from 0% to 80%, proving that pre-teaching him the vocabulary supports his reading comprehension skills, James actually had a lower score on his post-test indicating that pre-teaching him the vocabulary did not help. In addition, Peter made no increase on his score between the pre-test and the post-test. The stabilized score implies that pre-teaching the vocabulary makes no difference for him. However, on the pre-test Peter was unable to correctly choose the meaning of a vocabulary words from the passage in the comprehension questions, but was able to define the vocabulary word indicated in the questions for the post-test. Answering the vocabulary question correctly on the post-test suggests that he learned the meaning of the vocabulary word that was taught to him, but that it did not help his comprehension of the overall passage.

Many of the common comprehension reading strategies that have been used by teachers at this school and with the students who are deaf and hard of hearing at this school have been successful. Not all of the strategies have worked for every student every time, but the same is true in any classroom. The strategies that teachers are using work for a variety of reasons, but

mostly because they are proven to help support the reading comprehension of struggling readers, a category deaf and hard of hearing students are often placed in.

Uncommon Strategies that Support Reading Comprehension for Students who are Deaf or Hard of Hearing.

One strategy listed on the student and teacher questionnaires that is not necessarily a typical strategy that you see being used in a public school classroom regularly is adding pictures to the text. Because students who are deaf or hard of hearing rely on visual messages, many teachers add pictures to the texts that the students are reading to aid in their comprehension of that text. One hundred percent of the teachers who completes the questionnaire indicated that they add pictures to the text to increase student reading comprehension. They also reported that adding the pictures is a successful strategy for their students who are deaf or hard of hearing. Since teachers of the deaf are taught that that their students need more visual support during learning, these findings are unsurprising. A study conducted by Mich, Pianta, and Mana (2013) compared stories with pictures to stories without pictures and discovered that adding pictures to a story supports the reading comprehension of students who are deaf or hard of hearing. In their findings they state that “the simplified and illustrated stories, having a higher readability index, make the comprehension exercise easier and both children groups (deaf and hearing) got the best results (Mich, Pianta, & Mana, 2013, p. 42). One teacher commented that “Pictures are always beneficial when introducing new vocabulary or content. It’s visual and comprehension occurs at a faster rate” (Teacher Questionnaire, 2015). Based on this teacher response, it can be concluded that adding visuals while teaching students who are deaf or hard of hearing can support their learning in multiple ways. This teacher comment also supports the findings of Mich, Pianta, and Mana (2013) in which adding pictures supports the reading comprehension of students who are

deaf or hard of hearing. On the same topic, one of the teachers used the comment section under the adding pictures to text strategy to explain that she uses a program called News2You. News2You is a current event resource “with pictures to help kids with low vocab skills, helps kids enjoy reading, and keeps interest level high, even if the content is a little tough” (Teacher Questionnaire, 2015). This teacher response indicates that even if a text is higher than a student’s reading level, adding pictures can support the student’s reading comprehension of the text. The New2You resource was also mentioned during the focus group. One of the teachers who participated mentioned that she uses it “regularly to introduce informational text to her students and as a way to keep them informed about current events” (Focus Group Transcription, 2015). This teacher comment implies that the New2You is not only beneficial for student’s reading comprehension, but also as a way to build back ground knowledge about current events. Building background knowledge was another strategy proven to be successful for supporting reading comprehension in students who are deaf or hard of hearing.

In the section provided on the questionnaire for teachers to add any strategies that they use with students which are not already listed, 75% of the teachers reported that they use ASL (American Sign Language) to help with students with comprehension of the text. This data indicates that the teachers are aware of the importance of using the student’s first language to support their reading comprehension. The 75% of teacher who responded that they use ASL can be broken into two different categories. Fifty percent of the teachers said that they use ASL to sign the text before the students read and 25% of the teachers said they use ASL to create a bridge from printed English to American Sign Language. This data implies that using ASL to support reading comprehension can be done in more than one way. Using ASL is another example of an uncommon comprehension strategy used with students who are deaf or hard of

hearing that is successful. It is also the third strategy I used with the students in order to collect current data. I gave the students a copy of “The Giving Tree” by Shel Silverstein, asked them to read it independently, and then provided them with comprehension questions to answer. “The Giving Tree” story and comprehension questions was the pre-test. After that, I interpreted “The Ungrateful Tiger” by Julie Ellis using ASL. I then provided the students with comprehension questions related to that story and interpreted those into ASL as well. Below, in table 7, I have documented the scores from the pre-test and post-test.

Table 7

Student Work: Written English vs. ASL

Student Name	Pre-Test Score	Post-Test Score
James	40%	75%
Peter	80%	100%
Cory	93%	100%

Based on the scores listed in the table, using ASL to read a story increases the comprehension skills of these students who are deaf or hard of hearing. These scores indicate that by providing the students access to the text in their first language, we increase their ability to comprehend the text. Even though Cory’s test scores did not increase by a significant amount, his post- test was still higher than his pre-test. For James, using ASL caused a significant increase in his reading comprehension skills. These differences in scores imply that for Cory, he

doesn't necessarily need access to the text in his first language, but that for James it is extremely beneficial to translate texts into ASL.

A strategy that one teacher uses in the school similar to reading a text in sign for the students, she has named the English/ASL Sandwich strategy. She discussed this strategy with the other teachers and I during the focus group. Using technology, she screen shots a page of a story and then puts it into a video format. In between each book page, some is video recorded interpreting that portion of the story into ASL. Switching from a screen shot of a page to an ASL interpretation goes back and forth from the beginning of the story to the end of the story. The teacher reported seeing "increased reading comprehension in all of the students when a story was transformed in this manner" (Focus Group Transcription, 2015). The teacher comment implies that providing a story in a way that combines reading and ASL helps to improve the reading comprehension of students who are deaf or hard of hearing, which supports earlier findings that providing text in the student's first language increases reading comprehension. This strategy is another example of an uncommon reading comprehension strategy that is successful with deaf students. While common strategies tend to be successful with students who are deaf or hard of hearing, some additional strategies can be used or created specifically to meet the needs of these unique students.

Strategies that Do not Support Reading Comprehension for Students who are Deaf or Hard of Hearing

While many of the comprehension strategies that teachers use for struggling readers work for students who are deaf or hard of hearing, because of their unique needs, not all of them are successful. An example of this was mentioned during the focus group that I lead with a few

different teachers. They unanimously agreed that students taking turns reading, or reading together in groups, and read-a-louds (signing word for word instead of using American Sign Language) was not supportive of comprehension skills in students who are deaf or hard of hearing. This report from the teachers indicates that these traditional methods of reading do not support the reading comprehension skills of students who are deaf or hard of hearing. The reason these methods do not support the reading comprehension skills of these students is most likely due to the fact that in any of these situations, the students are not focused on the meanings of the words. In fact, one teacher specifically commented that “the students are so focused on signing the right sign for each word that they aren’t actually reading, and therefore they aren’t reading for meaning or understanding what they read” (Focus Group Transcription, 2015). The rest of the teachers in the group agreed with her statement, implying that they had experienced these methods not being successful with their students in the past. One teacher even added, “I don’t think they take turns reading in hearing school anymore either since the students are always only focused on the section they will have to read” (Focus Group Transcription, 2015). Her comment argues that since the students (deaf or hearing) are so focused on only the part they will need to read, they will not be able to comprehend the text in its entirety.

On the teacher questionnaires, 50% of the teachers indicated that summarizing is not always successful with their students. This data indicates that at least half of the time, summarizing does not support the reading comprehension of students who are deaf or hard of hearing. These students tend to be very detail oriented and therefore struggle with “big ideas”. In support of that, one teacher even left a comment that said “for many of my students, ‘main idea’ is vague. These students tend to get caught up in all the details, therefore are unable to summarize” (Teacher Questionnaire, 2015). Since the teacher statement argues that students are

so focused on the details and unable to summarize, it would appear that this strategy is not supportive of reading comprehension in students who are deaf or hard of hearing. Another teacher mentioned that “I typically chunk summarizing activities. I ask them to summarize a paragraph or a page at a time, then summarize the whole thing” (Teacher Questionnaire, 2015). This teacher comment implies that for students who are deaf or hard of hearing, summarizing can be successful when broken into smaller pieces of text as opposed to then text in its entirety. For the re-reading strategy, while most teachers indicated that it was successful, one of the teachers commented that it “Depends on the student. Some students hate to re-read and therefore it becomes pointless to use this strategy” (Teacher Questionnaire, 2015). The comment left by this teacher argues that for some students, re-reading is not a good strategy to support their reading comprehension as they do not want to use the strategy in the first place.

Based on the data, there are not many strategies that are not successful with students who are deaf or hard of hearing. As evident in Tables 1, 2, and 4, most students and teachers use a variety of strategies to support reading comprehension. However, not all of the strategies that are successful make as big of an impact as others. This was shown in tables 3, 6, and 7. While pre-teaching vocabulary increased Cory’s score on his post- test significantly, the re-reading strategy and using ASL to interpret a story, only increased his scores marginally. It can also be argued that where one strategy can be successful for most kids who struggle with reading comprehension that does not mean it will be successful for all students who are deaf or hard of hearing. For example, pre-teaching vocabulary to James did not support his reading comprehension on his test, but it did support the comprehension for Peter and Cory.

Implications and Conclusions

Based on the findings of my research, several implications can be presented to teachers of deaf and hard of hearing students. These implications include a variety of typical strategies that support the reading comprehension of students who are deaf or hard of hearing, additional strategies that are not typical but are successful in supporting the reading comprehension of students who are deaf or hard of hearing, and strategies that do not support the reading comprehension of students who are deaf or hard of hearing. Because students who are deaf or hard of hearing often struggle with reading comprehension, it is important for teachers of the deaf to be well informed about the type of strategies they can teach their students in order to support their reading comprehension. As Van Staden (2013) states, “The reading skills of many deaf children lag several years behind those of hearing children, and there is a need for identifying reading difficulties and implementing effective reading support strategies in this population” (p. 305).

The first implication of my research that should be presented to teachers are the main strategies which were found to support reading comprehension for students who are deaf or hard of hearing. These strategies are the same types of strategies used with typical struggling readers in order to increase their reading comprehension skills. In my research with the students, pre-teaching vocabulary and re-reading were both successful in increasing their reading comprehension scores between the pre-tests and post-tests. Based on the teacher questionnaire and the focus group, strategies such as providing background knowledge, Guided Reading are also successful in improving reading comprehension skills for students who are deaf or hard of hearing. These strategies are easily implemented in a classroom and should be used on a regular basis with all students, but especially with students who are deaf or hard of hearing.

The second implication from the findings of my research are the additional strategies that were discovered in the course of the study that are not typically found in most classrooms, but are tailored to meet the needs of students who are deaf or hard of hearing. There were a few different strategies that fell into this category found to be mostly successful with the students, all of which were visual in some manner. The first was signing the story and comprehension questions in American Sign Language. Giving the students access to the text in their first language provided them with the ability to more easily comprehend the story and therefore answer the comprehension questions more successfully. The second strategy is similar to the first strategy, but at another level. Using technology, the teacher takes screen shots a page of a story and then puts it into a video format. In between each book page, someone is video recorded interpreting that portion of the story into ASL. Switching from a screen shot of a page to an ASL interpretation goes back and forth from the beginning of the story to the end of the story. While common strategies tend to be successful with students who are deaf or hard of hearing, some additional strategies can be used or created specifically to meet the needs of these unique students. Teachers also reported that adding pictures to text was a successful strategy with deaf students as they were able to compare the words with the pictures and get the full meaning from the text. Last, but not least, a program called News2You was proven to be useful for students who are deaf or hard of hearing. This is a current event resource “with pictures to help kids with low vocab skills, helps kids enjoy reading, and keeps interest level high, even if the content is a little tough” (Teacher Questionnaire, 2015). The results from the data collected during this study indicate that some uncommon reading comprehension strategies can be used to support the reading comprehension skills of students who are deaf or hard of hearing.

The final implication discovered during the course of my research was the strategies that were found to be unsuccessful in supporting the reading comprehension of students who are deaf or hard of hearing. While many of the comprehension strategies that teachers use for struggling readers work for students who are deaf or hard of hearing, because of their unique needs, not all of them are successful. Even though there were not many strategies that did not at least marginally increase the reading comprehension skills of students who are deaf or hard of hearing, they are still important to note. If it has been shown numerous times that a strategy is unsuccessful for students, teachers need to be informed so that they are not wasting valuable classroom instruction time using something that will not help their students improve their reading comprehension skills. Reading in small groups or taking turns reading, was shown to not support reading comprehension skills in students who are deaf or hard of hearing due to the fact that the students were more focused only on their section they had to read or using the right signs to convey the message to their peers. Summarizing was also found to be unsuccessful for students who are deaf or hard of hearing as the students tend to focus too much on the details and cannot paraphrase the whole text into a short summary.

The main research question of this study was “What strategies can be used to successfully support the development or improvement of reading comprehension of students who are deaf or hard of hearing?” Some of the tools I used in order to collect data to answer the research question were teacher and student questionnaires, student work, and a transcription of a focus group. The findings of the research showed that many typical reading comprehension strategies were successful when used by students who were deaf or hard of hearing. The research also revealed some strategies that are not typically used with struggling reader, but were tailored to meet the needs of students who were deaf or hard of hearing. Lastly, the data showed that some

strategies do not increase the reading comprehension skills in students who are deaf or hard of hearing. The implications for teachers include implementing typical reading comprehension strategies with students who are deaf or hard of hearing, as well as some strategies that need to be tailored to meet those student's needs. An additional implication for teachers is to stay away from using strategies that are proved to be unsuccessful at supporting reading comprehension in students who are deaf or hard of hearing.

The main limitation of this study was time as we only had about two weeks to collect data. If I were to do this study again, I would like to take more time in working with the students and trying different intervention strategies to discover addition ways to support their reading comprehension. I would pay particular attention to recreating some studies I discovered in the course of the literature review. Because of funding or access to specific program, I was unable to try some of the interventions I read about in the current literature. The lack of funding or access was another limitation of this study.

After conducting my research, I am still left with a few questions regarding the strategies that could support reading comprehension in students who are deaf or hard of hearing. The main question I have is what impact does the amount of hearing loss or the type of assistive device used by a student have on the success of some reading comprehension strategies. As a teacher with students who have a variety of hearing ranges and assistive devices, it would be beneficial to know how each student will typically respond to reading comprehension strategies based on those aspects. Another question I have is, are there any current studies being done to discover the effectiveness of newer reading comprehension strategies for students who are deaf or hard of hearing. Currently most research I found concerning reading comprehension and students who are deaf or hard of hearing center around very unique strategies and programs. There was

nothing on using Close Reading with students who are deaf or hard of hearing even though it is a popular strategy used in many classrooms right now. My last question has to do with professional development. Are there any current professional development workshops specifically for teachers of the deaf to stay up to date with the current strategies that support reading comprehension in students who are deaf or hard of hearing? As this year is my first full year teaching, I am extremely interested to discover what kind of profession development is available to me so that I can best support my students in the classroom.

In conclusion, students who are deaf or hard of hearing often struggle with reading comprehension skills. They also have unique needs as their first language is visual instead of auditory. When teaching students who are deaf or hard of hearing, it is important to be informed about which strategies can be used in the classroom in order to support the reading comprehension skills of these students

References

- Aceti, K. & Wang, Y. (2010). The teaching and learning of multimeaning words within a metacognitively based curriculum. *American Annals of the Deaf* , 155(2), 118-123.
- Andrews, J. F. & Rusher, M. (2010). Codeswitching techniques: Evidence-based instructional practices for the ASL/English bilingual classroom. *American Annals of the Deaf* , 155(4), 407-424.
- Apel, K. & Masterson, J. J. (2015). Comparing the spelling and reading abilities of students with cochlear implants and students with typical hearing. *Journal of Deaf Studies and Deaf Education*, 20(2), 125-135.
- Benedict, K. M., Rivera, M. C., & Antia, S. D. (2015). Instruction in metacognitive strategies to increase deaf and hard-of-hearing students' reading comprehension. *Journal of Deaf Studies and Deaf Education*, 20(1), 1-15.
- Bedard, C., Van Horn, L., & Garcia, Viola M. (2011). The Impact of Culture on Literacy.
- Colin, S., Leybaert, J., Ecalte, J., & Magnan, A. (2013). The development of word recognition, sentence comprehension, word spelling, and vocabulary in children with deafness: A longitudinal Study. *Research in Developmental Disabilities*, 34, 1781-1793.
- Daza, M., Philips-Silver, J., Ruiz-Cuadra, M., & Lopez-Lopez, F. (2014). Language skills and nonverbal cognitive processes associated with reading comprehension in deaf children. *Research in Developmental Disabilities*, 35, 3526-3533.
- Dimling, L. M. (2010). Conceptually based vocabulary intervention: Second graders' development of vocabulary words. *American Annals of the Deaf* , 155(4), 425-448.

- Ferdman, Bernardo M. (1990). Literacy and Culture Identity. *Harvard Educational Review*.
- Freebody, P., & Luke, A. (1990). Literacies programs: Debates and demands in cultural context. *Prospect*, 5(7), 7-16
- Friedmann, N. & Szterman, R. (2001). The comprehension and production of wh-questions in deaf and hard-of-hearing children. *Journal of Deaf Studies and Deaf Education*, 16(2), 212-235.
- Giang, D. L. & Inho, C. (2014). Comprehension of figurative language by hearing impaired children in special primary schools. *Social and Behavioral Sciences*, 191, 506-511.
- Hermans, D., Knoors, H., Ormel, E., & Verhoeven, L. (2008). The relationship between the reading and signing skills of deaf children in bilingual education programs. *Journal of Deaf Studies and Deaf Education*, 13(4), 518-529.
- Hoffman, M. & Wang, Y. (2010). The use of graphic representations of sign language in leveled texts to support deaf readers. *American Annals of the Deaf*, 155(2), 131-136.
- Kelly, R. R. & Berent, G. P. (2011). Semantic and pragmatic factors influencing deaf and hard of hearing students' comprehension of English sentences containing numeral quantifiers. *Journal of Deaf Studies and Deaf Education*, 16(4), 419-436.
- Kucer, S. (2009). *Dimensions in Literacy: A conceptual base for teaching reading and writing in school settings*. (3rd Ed.). Mahwah, NJ: Erlbaum
- Kunisue, K., Fukushima, K., Kawasaki, A., Maeda, Y., Nagayasu, R., Kataoka, Y., Kariya, S., Fukutomi, Y., Takami, H., & Nishizaki, K. (2007). Comprehension of abstract words among hearing impaired children. *International Journal of Pediatric Otorhinolaryngology*, 71, 1671-1979.

- Lopez-Higes, R., Gallego, C., Martin-Aragoneses, M., & Melle, N. (2015). Morpho-syntactic reading comprehension in children with early and late cochlear implants. *Journal of Deaf Studies and Deaf Education*, 20(2), 136-146.
- McDermott, R., Varenne, H. (1995). Culture “as” Disability. *Anthropology & Education Quarterly*, 26(3), 324-348.
- Miller, P. (2005). Reading comprehension and its relation to the quality of functional hearing: evidence from readers with different functional hearing abilities. *American Annals of the Deaf*, 150(3), 305-323.
- Mich, O., Pianta, E., & Mana, N. (2013). Interactive stories and exercises with dynamic feedback for improving reading comprehension skills in deaf children. *Computers & Education*, 65, 34-44.
- Monreal, S. T. & Hernandez, R. S. (2005). Reading levels of Spanish deaf students. *American Annals of the Deaf*, 150(4), 379-386.
- Nikolraizi, M., Vekiri, I., & Easterbrooks, S. R. (2013). Investigating deaf students’ use of visual multimedia resources in reading comprehension. *American Annals of the Deaf*, 157(5), 458-473.
- Schirmer, B. R, Schaffer, L., Therrien, W. J., & Schermer, T. N. (2012). Reread-adapt and answer-comprehend intervention with deaf and hard of hearing readers: Effect on fluency and reading achievement. *American Annals of the Deaf*, 156(5), 469-475.

- Sullivan, S. & Oakhill, J. (2015). Components of story comprehension and strategies to support them in hearing and deaf or hard of hearing readers. *Top Lang Disorders*, 35(2), 133-143.
- Trezek, B. J. & Wang, Y. (2006). Implications of utilizing a phonics-based reading curriculum with children who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education*, 11(2), 202-213.
- van Staden, A. (2013). An evaluation of an intervention using sign language and multi-sensory coding to support word learning and reading comprehension of deaf signing children. *Child Language Teaching and Therapy*, 29(3), 305- 318.
- Vermeulen, A. M., van Bon, W., & Schreuder, R. (2007). Reading comprehension of deaf children with cochlear implants. *Journal of Deaf Studies and Deaf Education*, 12(3), 283-302.
- Wang, Y. & Paul, P. V. (2001). Integrating technology and reading instruction with children who are deaf or hard of hearing: The effectiveness of the cornerstone project. *American Annals of the Deaf*, 156(1), 56-68.
- Wauters, L., van Bon, W., Tellings, A., & van Leeuwe, J. (2006). In search of factors in deaf and hearing children's reading comprehension. *American Annals of the Deaf*, 151(3), 371-380.
- Wolfram, W. (2000). Everyone has an accent. *Teaching Tolerance*, 18, 18-23.

Appendix A
Focus Group- Guiding Questions

1. What common reading strategies have you successfully used to support reading comprehension in student's who are Deaf or Hard of hearing?
 - 1a. Why do you think they worked?
2. What other kinds of strategies (uncommon) have you successfully used to support reading comprehension in students who are Deaf or Hard of Hearing?
 - 2a. Why do you think they worked?
3. What strategies did you find to be unsuccessful with students who are Deaf or Hard of Hearing?
 - 3a. Why do you think they did not work for those students?

Appendix B

Faculty/Staff Questionnaire

Name: _____ Position: _____ Number of years teaching: _____

Please circle Yes or No to indicate if you have used the comprehension strategies listed below and Yes or No to indicate if it was successful with your students. Below each strategy, please explain why it was or was not successful.

1. Close Reading: Yes No Successful: Yes No

Why or Why not? _____

2. Story Maps Yes No Successful: Yes No

Why or Why not? _____

3. Venn-Diagrams Yes No Successful: Yes No

Why or Why not? _____

4. Summarizing Yes No Successful: Yes No

Why or Why not? _____

Appendix C

Student Questionnaire

Name: _____

Grade: _____

Please put a check mark in the box next to the reading comprehension strategies you have used from the list below. If you think a strategy has helped you understand what you read, put a star in the second box.

1. Close Reading

Why or why didn't this strategy work for you?

2. Story Maps

Why or why didn't this strategy work for you?

3. Venn-Diagrams

Why or why didn't this strategy work for you?

4. Summarizing

Why or why didn't this strategy work for you?

5. Having pictures added to the text

Why or why didn't this strategy work for you?

6. Re-reading the story

Why or why didn't this strategy work for you?

List any other strategies you have used that helped you understand what you were reading and explain why you think it helped.
