**THINKING BEYOND THE WORDS: STRENGTHENING READING
COMPREHENSION FOR STUDENTS WITH ASD**

by

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PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION
IN
SPECIAL EDUCATION

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

October 2019

Abstract

The purpose of this project is to provide a handbook for classroom and special education teachers. This handbook is to assist teachers helping their students with ASD to develop reading comprehension skills. This project begins with background information regarding ASD and prevalence rates for ASD along with a discussion about reading comprehension. A literature review outlines the difficulties students with ASD have with reading comprehension and examines the specific areas with which students struggle. An outline of how the project is structured is given and finally a handbook is presented that outlines strategies for teachers to use for each area of deficit which students may encounter. The handbook provides a variety of strategies for each area identified.

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Chapter 1: Introduction

Reading is defined as a cognitive process in which symbols are deciphered to arrive at meaning. Reading is more than letter recognition. Through this cognitive process information is organized into patterns, which are then recognized and connections are made. This information is then processed, resulting in the comprehension of the meaning of the written text (Norris, 1998). Reading comprehension is the mental process that allows the reader to understand the text. Reading is fundamental to helping individuals find and convey information and is a necessary skill as it helps people to discover new things, to develop the mind and imagination, and to improve both written and spoken communication. Having good reading skills allows individuals to develop good self-images. Students who do not have good reading comprehension skills often struggle with academics (Akbasli, Sahin, & Yaykiran, 2016; Knight & Sartini, 2014).

The purpose of reading is to get meaning from text. Without comprehension, reading is just an exercise in recognizing words on a page. Students need to be able to not only identify words but to process those words to understand the meaning being conveyed by those words. Reading comprehension is the cornerstone for understanding much of the information that is presented in classrooms. Whether participating in subject areas ranging from Social Studies to Science, students benefit from having strategies on which to rely on to help them understand printed material (Akbasli et al., 2016; Neufeld, 2005).

My project focused on students with Autism Spectrum Disorder (ASD) and reading comprehension. In my 15 years working in Special Education in my present

school district, I have worked with a number of students with ASD who have struggled

with reading comprehension. My project examined the reasons for the difficulties these

students have and compiled a number of strategies to allow both Special Education

teachers and classroom teachers to develop and set up a literate community in the

classroom for students with ASD. I argue that, as a teacher, having one resource that

compiles multiple ideas and strategies to try with both students with ASD, and other

students who may struggle with reading comprehension, could be very useful.

Significance of the Project

Students with ASD deserve to receive quality education that addresses their needs

within the classroom. With the recorded increase in the number of students diagnosed

with ASD, approximately 1 in 66 children and youth in Canada (Public Health Agency of

Canada [PHAC], 2018), and therefore, the increased number of students with ASD in

general education classrooms, there is a need for more resources to help guide classroom

teachers to support students with ASD. Past research outlines the consistency in reading

comprehension difficulties that students with ASD encounter in the classroom,

specifically pinpointing the areas where students may struggle. Like typical developing

students, students with ASD should be treated as individuals and have their reading

abilities assessed to determine their specific difficulties with reading comprehension. To

this end, I have written a handbook that identifies the areas where students with ASD

may struggle with reading comprehension and the handbook provides specific reading

comprehension strategies to be taught depending on the student's areas of struggle.

In the course of my research, I discovered that there are numerous studies that

show that difficulties with reading comprehension are a fairly common trait for students

with ASD. Many research studies (Brown, Oram-Cardy, & Johnson, 2013; Chandler-Olcott & Kluth, 2009; Gately, 2008; Mirenda, 2003; Nation, Clarke, Wright, & Williams, 2006; O'Connor & Klein, 2004) identify areas of difficulties students with ASD may encounter with reading comprehension and these studies often suggest one or two strategies to use to help support students with ASD. None of these studies provided an in-depth list of strategies that are appropriate for each of the areas where students are struggling with reading comprehension. I believe that compiling all of these areas of difficulty and the strategies that support each area all into one book would be very useful for both classroom teachers and special education teachers.

Background of the Project

In my 22 years of teaching, 15 of which have been in Special Education, I have worked with a number of students with ASD. I have watched when many of these students have been isolated from their assigned classrooms and segregated into resource rooms where often their needs have not been met. I am proud to say that I feel I have always had an inclusive classroom where I strive to meet all students' needs. I admit to being nervous and concerned about my skills and abilities to meet the variety of needs in my classroom, especially for those exceptional students in my class, particularly at the beginning of my career. As a special education teacher, I work hard to ensure all students are included in classrooms. As part of this, I feel my job is to provide both personal support and resources to help classroom teachers feel that they are capable of meeting the needs of their students.

When I began the journey of completing my Master of Education in Special Education, I knew I wanted to complete a project with something to do with students with

ASD or one to do with reading. In a conversation with our district Provincial Outreach

Program for Autism and Related Disorders (POPARD) consultant, she suggested that I

combine the two areas and design a handbook outlining reading comprehension strategies

for students with ASD. Her comment was that it was the one resource she had never

been able to put in the hands of classroom teachers. While teachers I work with seem to

have been able to identify that their students with ASD struggle with reading

comprehension, they often do not feel they have enough knowledge or skills to help these

students work to develop the required skills. These comments sparked my curiosity and I

asked my colleagues how they felt about teaching students with ASD to comprehend text.

The overwhelming response was they felt unprepared to help these students. I then asked

my colleagues if they felt a handbook outlining strategies to use would be beneficial and

they all agreed it would be a useful tool.

Personal Location

In my many years of teaching, I have taught all grades from Grade 1 to 7 and all

subject areas for these grades. It was during this time that I had the opportunity to work

in an elementary school that housed an elementary resource room. There were a number

of students in the school with a variety of disabilities. I had the pleasure of having one of

these students in my classroom and accepted it was my job to ensure that this student had

scheduled times in our classroom during which he was able to participate in our activities,

such as circle, centers, art, gym, and music. The students and I also worked hard to

ensure that when any new activity began in our class in which we felt he could

participate, the students would physically offer him an invitation to attend the activity. I

realized that I was one of few teachers in the school who was embracing inclusivity in my

classroom. As I have moved into Special Education, I have worked hard to support the

classroom teachers in my schools to ensure that special needs students are included in the

classroom as much as possible. I see my role as not only that of supporting the students

but the teachers as well. In this role of supporting teachers, I have come to realize that

teachers value having physical resources that they can consult to help them support their

students and to feel they have the capabilities of working with students with

exceptionalities. As ASD is the fastest-growing diagnosis that appears to be emerging in

the school I work in, I have had a number of conversations with teachers about their

students and the fact that reading comprehension appears to be a common struggle for

their students with ASD. These conversations have led me to believe that this proposed

handbook to help teachers support students who are struggling with reading

comprehension would be useful.

Research Question

      The question I posed in this study to design a handbook for teachers was: What

are key issues for working with students with ASD who experience reading

comprehension difficulties?

Project Overview

      The goal of this project was to create a handbook for classroom teachers and

Special Education teachers to outline the difficulties students with ASD may experience

when trying to comprehend written text and the specific strategies that teachers can use to

help these students with ASD to develop their reading comprehension skills. The

handbook discusses what reading comprehension is and why students with ASD struggle

with comprehending reading materials. The book looks at reading assessment and

ensuring that those assessing students are not simply using reading assessments to get a number or a grade, but rather to assess where students are struggling and the specific area of reading comprehension where they may struggle. The book also examines each of the five areas where students may struggle, explaining each area in depth. The suggested strategy section of the handbook is broken into five sections, outlining useful strategies for each of the areas where a student may struggle: (a) Theory of Mind, (b) Weak Central Coherence, (c) Executive Dysfunction (d) Hyperlexia, and, (e) Language Impairments.

Chapter Summary

In Chapter 1, I provided an introduction to my project topic. In doing so, I discussed the increase in the number of students with ASD in classrooms and the significance of the need for a handbook to help teachers deliver quality reading comprehension instruction to these students. I also discussed my personal location regarding the need for the handbook.

In Chapter 2, I will provide a literature review that examines literature that is relevant to my project. I will begin with a look at what ASD is and the prevalence of it in society. This is will be followed by a look at the reading process, what it is and what the key issues are for students with ASD who struggle with reading comprehension. Specifically, I will review literature that discusses Theory of Mind, Weak Central Coherence, Executive Dysfunction, Hyperlexia, and Language Impairments. Finally, I will examine the need for a handbook that outlines strategies to help teachers teach reading comprehension skills to students with ASD.

Chapter 3 will detail the research methodology and the methods used to collect and categorize relevant information to be used to compile the handbook. This chapter will include an outline of the main areas of the handbook.

Chapter 4 will contain the handbook, *Thinking beyond the words: Strengthening reading comprehension for students with ASD*.

Chapter 5 will be comprised of a discussion of results of the qualitative content analysis and a summary of the project, how the handbook will be shared with colleagues as well as my final reflections on the project.

Chapter 2: Literature Review

The last chapter outlined the study and its purpose to set the foundation for this project. This chapter begins with an overview of ASD in order to frame the study and to characterize the exceptionality in the context of the research. The reading process will then be examined, discussing the skills that are required to be successful at comprehending printed text. This section will also emphasize the importance of understanding that reading is not just about decoding and that the ability to comprehend printed text is an important component of the reading process. Research that examines reading comprehension difficulties will then be reviewed. This section of the literature review will demonstrate that research has identified reading comprehension deficits as common amongst students with ASD. Then the specific reasons that students with ASD struggle with reading comprehension will be reviewed. Theory of mind, weak central coherence, executive dysfunction, hyperlexia and language impairments will all be defined and their links to reading comprehension deficits will be discussed. Lastly, the reasons for the need for a handbook that outlines reading comprehension strategies to use with students with ASD will be outlined.

Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder (ASD) is the name for a group of developmental disorders that include a wide range, or spectrum, of symptoms and levels of disabilities. People with ASD demonstrate a variety of deficits in the areas of: social interactions, communication, and repetitive behaviours. People with ASD have impairments that vary from person to person and from symptom to symptom. In 2013, the American Psychiatric Association changed the diagnostic criteria for ASD from the four previous

diagnoses of autistic disorder, childhood disintegrative disorder, pervasive developmental disorder - not otherwise specified (PDD-NOS), and Asperger syndrome merging them under the border term of ASD (Hyman, 2013). The change in diagnostic criteria went from three domains of symptoms (social impairment, language/ communication impairment, and repetitive/restricted behaviours) to two domains (social communication impairment and restricted interests/ repetitive behaviours). The American Psychiatric Association (APA, 2013) stated that the revised diagnosis was representative of a new, more accurate, and medically and scientifically useful way of diagnosing individuals with autism-related disorders. The recommended change in criteria was made by the Neurodevelopmental Work Group, led by Susan Swedo, MD, senior investigator at the National Institute of Mental Health. The work group believed that a single umbrella disorder would improve the diagnosis of ASD without limiting the sensitivity of the criteria, or substantially changing the number of children being diagnosed. Under the Diagnostic and Statistical Manual of Mental Disorders (5th Edition), individuals with ASD would be required to show symptoms from early childhood, even if these symptoms were not recognized until later in their life. The criteria change encouraged earlier diagnosis of ASD but also allowed people whose symptoms many not have been fully recognized until social demands exceeded their capacity to receive the diagnosis (APA, 2013).

Along with the change in criteria, the DSM-5 also identified levels of severity for the spectrum disorder. Symptom severity of each of the two areas of diagnostic criteria were now defined and were based on the level of support required for those symptoms and reflected the impact of co-occurring deficits such as intellectual disabilities, language

impairment, medical diagnoses and other behavioural health diagnoses (Hyman, 2013).

Level 3 severity was defined as requiring very substantial support, level 2 required

substantial support, and level 1 required support (APA, 2013).

Each person with autism is unique; while some people with ASD live

independently, others have severe disabilities and receive life-long care and support

(World Health Organization [WHO], 2018). Many people with ASD demonstrate

exceptional abilities in visual skills, music and academic skills. Forty-four percent of

people with ASD have average to above average intellectual abilities. Other people with

ASD have considerable disabilities and are unable to live independently (WHO, 2018).

Approximately 30% of individuals with ASD are nonverbal but can communicate using

other means (Tager-Flusberg & Kasari, 2013) such as with sign language or augmentative

and alternative communication devices.

Approximately 1 in 66 children and youth are diagnosed with ASD in Canada

(Public Health Agency of Canada [PHAC], 2018). It occurs in all racial, ethnic, and

socio-economic groups (PHAC, 2018). The prevalence of ASD has increased by over

100% in the last 10 years and ASD is now the fastest-growing and most-commonly

diagnosed neurological disorder in Canada (Humphrey, 2018), which corresponds to an

increase in the number of students in general education classes who are diagnosed on the

autism spectrum (Carnahan & Williamson, 2016).

Students with ASD present with varied ability levels in all school subjects, much

like their typical peers. There has been significant research conducted related to students

with ASD and reading comprehension. It is commonly reported that many students with

ASD struggle with comprehension, mainly due to the fact that people with ASD often

struggle with integrating language, social understanding, and the emotional intent of messages (Lim, 2018). Many students with ASD have deficits in language and social cognition and difficulty interpreting and labeling each of these aspects of communication to gain meaning. The ability to understand and interpret various cues is necessary for effective comprehension of narrative texts. Some research reports that some students with ASD are good readers when it comes to decoding; however, they struggle with comprehending the materials they read (Frith & Snowling, 1983; Nation et al, 2006).

The Reading Process

The end goal of reading is to understand messages conveyed by text (Ricketts, 2011). In her 2011 review, Ricketts stated that to become a skilled reader, students must master two sets of skills; word recognition and oral language comprehension processes. She reviewed studies regarding reading comprehension and children with specific language impairment (SLI), Down's syndrome (DS), and ASD. Three studies were examined in regard to SLI, four for DS, and three for ASD. These articles were selected based on a search of the ISI Web of Knowledge database to 2011. Ricketts used the Simple View of Reading as a framework for considering reading comprehension in these groups. Based on the researcher's review of the selected research articles, the conclusion was drawn that there is substantial evidence for reading comprehension impairments in SLI and growing evidence that weaknesses in this domain are common in DS and ASD. She also concluded that in all three of these groups reading comprehension is more impaired than word recognition. From these conclusions, one can postulate that reading comprehension is a complex skill that requires the use of a number of cognitive

processes, that simply being able to read words and texts accurately is not sufficient for reading comprehension.

Randi, Newman, and Grigorenko (2010) completed a literature review of research studies that looked at what makes reading comprehension difficult for children with ASD. The researchers reviewed 13 research articles in relation to cognitive skills and processes, what makes reading comprehension difficult, cognitive profiles of individuals with ASD, turning cognitive weaknesses into strengths, reading comprehension and narrative text, reading comprehension interventions implemented with children on the spectrum. In reviewing the research studies, Randi et al. (2010) argued that to comprehend, students must know the meaning of words and be able to analyze syntactic and semantic structures of word combinations, draw on personal background knowledge, understand the underlying meaning of text and rely on metacognitive structures such as self-monitoring. Based on this review of the literature, it may be theorize that to demonstrate competent reading comprehension skills, students must demonstrate the ability to use two forms of processing.

In their 2005 chapter, Perfetti, Landi and Oakhill sketched a developmental model of reading comprehension that would allow for the individuals with a reading comprehension deficit to emerge that is specific to reading. Their model had five key assumptions: general skills in reading comprehension increase with reading experience and for some components with spoken language experience; reading comprehension and listening comprehension are related throughout development; word identification skills set a limit on how closely reading comprehension skill can approach listening comprehension skill; knowledge of word meanings is central to comprehension; higher

levels of comprehension require the reader to apply a high standard of coherence to the understanding of the text. A reader must be able to identify words and engage language-processing mechanisms to assemble words into messages. These processes allow readers to understand word meanings in appropriate context, to analyze a string of words and provide the underlying meaning of sentence information into more complete representations of extended text.

Successful reading comprehension needs both sets of processes to operate adequately (Nation & Norbury, 2005; Perfetti et al., 2005). Nation and Norbury (2005) examined reading comprehension deficits in three groups of children: children identified with specific impairments in reading comprehension, children with ASD, and children with specific language impairment. In their review they emphasized that in all three groups poor reading comprehension was often associated with weaknesses in oral language. They indicated that reading comprehension deficits were not common and that many children were able to read effectively by mid-childhood; however, some children had deficits in understanding what they read. Nation and Norbury (2005) applied a framework to understand variations in the reading comprehension skills of the subjects, and they provided appropriate interventions to improve participants' comprehension of the texts. The framework allows educators to identify the needs and challenges of a student. Their results showed that phonological skills were important to the ability to decode text, but non-phonological language skills, syntax, semantics, morphology, and pragmatics contributed to text comprehension. These results could, like those of Randi et al., demonstrate that, to be a successful reader, individuals must be able to use both sets of processes that allow them to decode and comprehend.

ASD and Reading Comprehension Difficulties

In a landmark study, Frith and Snowling (1983) examined reading comprehension in students with autism and dyslexia. Their research was comprised of three groups: (a) six boys and two girls, aged 9 to 17 with classic symptoms of autism: (b) eight boys, aged 10 to 12 who were deemed to be dyslexic and were referred for their poor reading skills for their age and IQ: and (c) eight boys and two girls, aged 9 to 10 with average reading abilities. The groups were matched based on their results on the British Abilities Scale (BAS) Word Reading Test in which single words were read aloud. After the students were matched, the Neale Analysis of Reading Ability (NAR) was administered, which required students to read aloud a short story and to answer questions about the story. Frith and Snowling's results showed that when the students with autism were compared to the group with dyslexia, the students with autism performed at similar levels in terms of reading accuracy, however, the students with autism achieved significantly lower scores for reading comprehension than the students with dyslexia.

While this research study is over 30 years old, it continues to be relevant as Frith and Snowling's conclusion that when it comes to reading comprehension, the area of most difficulty for individuals with ASD is their inability to infer meaning from both semantic and social context of the text they are reading. This conclusion connects to the APA's 2013 definition of ASD that includes persistent challenges in social reciprocity, social relationships and nonverbal communication. This study is considered a landmark in research as the results have stood the test of time and similar results have been reported in numerous studies (Happé, 1997; Heumer and Mann, 2010; Nation et al., 2006; Norbury

& Nation, 2011) that have been completed since using the same or equivalent tests of reading ability.

Nation, Clarke, Wright, and Williams (2006) investigated patterns of reading ability in a sample of 41 children with ASD, through an assessment of four components of reading skill: word recognition, nonword decoding, text reading accuracy and text comprehension. The results emphasized the heterogeneity of reading skills in children with ASD. While a total of nine children were unable to read at all, 20 children achieved word-reading levels in the average or above average range, however, 10 of these children were found to have impaired reading comprehension as well as impairments in vocabulary and oral language comprehension. Overall, the majority of children in the sample showed a discrepancy between reading accuracy and reading comprehension. In 10.3% of the sample, individuals' comprehension scores were significantly below their reading accuracy score and a total of 65% of the sample showed poor reading comprehension. These results would seem to suggest that while many children with ASD develop age- appropriate word reading skills, reading comprehension does not develop parallel to these other skills; decoding, word recognition, and text reading accuracy.

Their results showed that a large portion of participants showed impairments in comprehension of text, vocabulary, and oral language, which suggested not all children with ASD who display reading comprehension difficulties are hyperlexic. The study showed that readers with ASD consistently demonstrate a reading pattern that is characterized by impairments in comprehension relative to word level decoding, a pattern that they felt was explained by weak central coherence, which identifies that readers with ASD see parts rather than wholes.

The sample size in the Nation et al. (2006) study has been be viewed as being too small to use to generalize the results that there is a discrepancy between reading accuracy and comprehension to a wider population of students with ASD. In response to the study by Nation et al. (2006), Huemer and Mann (2010) set out to establish a comprehensive profile of decoding and comprehension skills within a larger sample of 384 children with ASD. They attained this sample through 41 private nationwide learning centers in the United States of America and one from the United Kingdom. These centres provide one-to-one reading and comprehension instruction for children with learning disabilities or developmental disorders. The sample consisted of three groups: 171 children with autism (mean age 10.41 years), 119 with PDD-NOS (Pervasive Developmental Disorder Not Otherwise Specified - mean age 10.08 years) and 94 children with a diagnosis of Asperger Syndrome (mean age 11.37 years). All children in the sample were able to communicate verbally and had measurable reading abilities. The researchers also included a comparison group of 100 children with dyslexia (mean age 11.21 years). The researchers were not able to include a comparison group of typically developing children, however, they used standard scores as a way of making a comparison to population norms.

The analyzed data consisted of a battery of eight standardized measures of decoding, word recognition and reading comprehension (including both oral and written tasks) administered when children enrolled in the learning centers; Woodcock Reading Mastery Test-Revised (WRMT-R), Slosson Oral Reading Test-Revised (SORT-R), Gray Oral Reading Test, 4th edition (GORT-4), Lindamood Auditory Conceptualization Test (LACT), Peabody Picture Vocabulary Test- 3rd edition (PPVT-III), Detroit Tests of

Learning Aptitude - 4th edition (DTLA-4) *Word Opposites*, and the Detroit Tests of

Learning Aptitude - 2nd edition (DTLA-2) *Oral Directions*. Using the outcomes from

the previous study by Nation et al. (2006), the researchers predicted that the children with

ASD (all groups) would achieve lower scores on all reading comprehension measures

than those with dyslexia. They also predicted that the students with dyslexia would score

lower on measures of decoding and word recognition than the ASD group.

Difficulties for Students with ASD

As previously stated, there appears to be a broad agreement within the research on

reading comprehension and students with ASD that children with ASD have impaired

reading comprehension levels (Frith & Snowling, 1983; Nation et al., 2006). While there

is evidence that some students with autism can read accurately, even amongst those

students, there is evidence that levels of reading comprehension are poor (Frith &

Snowling, 1983; Minshew, Goldstein, & Siegel, 1995).

In a 2017 study, Grimm, Solari McIntyre, Zajic, and Mundy compared the

development trajectories of linguistic and reading comprehension in a sample of students

with ASD and age-matched typically developing peers (TD). Students were between the

ages of 8 and 16 with 84 students who had been diagnosed as ASD with no co-existing

diagnosis and 44 aged-matched TD students. Due to some missing data, the results of the

study were based on 65 students with ASD and 37 TD students. The ASD group

consisted of 55 boys and 10 girls, where as the TD group consisted of 24 boys and 13

girls. Students were assessed three times over a 30-month period, with 15 months

between the first assessment and the second assessment and 15 months between the

second and third assessments. Linguistic comprehension was assessed using the

Auditory Reasoning subtest of the Test of Auditory Processing Skills, Third Edition (TAPS-3). Reading comprehension was assessed using the Gray Oral Reading Test-Revised, 5th Edition (GORT-5). Grimm et al. (2017) concluded that the ASD group performed significantly lower than the TD group on the initial assessments and the deficit continued to be of note on the second and third assessments. Grimm et al. (2017) noted that while ASD symptom severity and oral language are related to reading comprehension, the reading profiles of children with ASD are not homogenous. It can be inferred from this conclusion that if students with ASD have different reading profiles they must have different needs when it comes to developing reading comprehension skills and, therefore, they would need different skills and strategies taught based on their individual profiles.

       Theory of mind. In 1985, Baron-Cohen, Leslie and Frith proposed one of the most prominent cognitive theories for people with ASD. They proposed that individuals with ASD fail to acquire an intuitive *theory of mind* that typically develops between the ages of four and six years old. Theory of mind is the ability to understand, empathize with, or make predictions based on the perspectives of others.   Baron-Cohen et al. (1985) identified that children with ASD, compared to typically developing peers, are impaired in their understanding of metal states and experience greater difficulty attributing metal states to themselves and others. This well-known research involved presenting children with ASD, Downs Syndrome and typically developing children with the Sally-Anne *false-belief* task. One doll (Anne) moved Sally's marble from the basket where she had hidden it to the box while she was gone. Over 80% of the typically developing and Downs Syndrome group responded correctly when asked where Sally would look for her

marble. They understood that Sally would look in the basket, that she held a false belief.

However, the ASD group's performance was impaired, with only 20% able to predict

correctly where Sally would look.

The relevance of impairments in theory of mind with the cognitive processing

required to comprehend written discourse has been demonstrated with experimental

studies involving the understanding of narrative materials. When reading stories, readers

are required to attribute mental states to the characters in order to understand their

motives and cause and effect relationships. White, Hill, Happé and Frith (2009) adapted

a series of stories originally developed by Happé (1994) in order to measure theory of

mind ability. The original study (Happé, 1994) consisted of a set of short story vignettes

followed by a question that required the attribution of mental states, such as desires,

beliefs or intentions, to characters in the vignettes. One example is a question that

required the reader to identify that a character did not answer a question truthfully but

rather told a "white lie" to avoid hurting another character's feelings.

In the original study, Happé (1994) found that autistic subjects were impaired

when providing context-appropriate explanations for the mental state stories compared to

controls. White et al. (2009) adapted these stories to include five different sets: mental

state, human physical state, animal physical state, and nature stories plus unlinked

sentences. The researchers found that the children with ASD who performed poorly on

the theory of mind tasks were also significantly impaired on the mental state, human

physical state, and the animal physical state stories but not on the nature stories. The

highest degree of impairment was recorded on the mental state stories and the lowest on

the animal stories. White et al. (2009) confirmed Happé's original findings that

individuals with ASD struggle to attribute mental states, such as desires, beliefs or intentions, to characters in the vignettes whether the characters be humans or animals.

Considering that books written for children contain many references to metal states, it is not surprising that students with ASD experience reading comprehension difficulties when they are expected to use the theory of mind to understand the thoughts, behaviours and motives of characters. If the attribution of mental states is a requirement to understand simple childhood books, deficits in theory of mind may have a significant impact on the ability of those with ASD to comprehend stories. Individuals with ASD may struggle with reading comprehension because they struggle to understand characters perspectives, to make inferences about the motives and behaviours of characters, or to make accurate predictions (Finnegan & Accardo, 2018; Lucas & Norbury, 2014).

Weak central coherence. Frith (1989) first used the term *weak central coherence* to refer to a tendency for individuals to attend to specific details rather than the overall gist of an event (Happé & Frith, 2006). Frith was referring to the ability of typically developing individuals to process information by understanding the bigger picture rather than remembering every specific detail. For individuals with ASD, Frith proposed that they had weak central coherence, a processing bias for remembering specific details at the expense of extracting the gist and contextual meaning. Readers with ASD may focus on minuscule, and possibly insignificant, details in text rather than on the bigger picture. This focus challenges their ability to comprehend and store pertinent information. As suggested by Randi et al. (2010) and Carnahan and Williamson (2010), while understanding words and sentences is important for comprehension, it is possible to understand the meaning of a word or sentence and not understand the message being

conveyed by the entire text. Readers with weak central coherence may be able to decode words or understand specific vocabulary but may not understand the meaning of the text in its entirety.

Weak central coherence is accepted as a particular cognitive style with a superiority in local processing (Happé & Frith, 2006). Research that supports the weak central coherence hypothesis has focused on the consistent superior performance of individuals with ASD, compared to controls, where tasks require attention to specific details (Happé & Frith, 2006).

Reading comprehension is dependent on integrating information from within the same text and from prior knowledge or external knowledge in order to establish meaning (Nation & Norbury, 2005). The idea of weak central coherence presents an explanation of how cognitive characteristics of individuals with ASD may contribute to difficulties with comprehending written texts. A predisposition to focus on specific details combined with the tendency to struggle with combining information to form a coherent whole, may contribute to difficulties with comprehending a written text for students with ASD. In other words, it is possible to understand at a word or sentence level without understanding the message the text is conveying in its entirety.

In their 2004 study, Wahlberg and Magliano assessed whether high functioning readers with ASD were able to draw upon background knowledge and then integrate that knowledge to help them comprehend ambiguous text. Their findings supported the premise that individuals with ASD have difficulties making use of relevant background knowledge compared to typically developing individuals. Perfetti et al. (2005) emphasized that readers who tried to establish a thorough understanding of reading

materials were described as having a high standard for text coherence and were more likely to self-monitor than those readers with a low standard for text coherence.

Executive dysfunction. Executive functioning includes functions such as planning, controlling impulses, working memory, shifting set, initiating and monitoring actions and inhibiting predominant responses (Hill & Frith, 2003). Many studies investigating executive functioning in individuals with ASD (Hughes, Russell & Robins, 1994; Ozonoff & Jensen, 1999) reported significantly impaired performance on tasks designed to measure particular aspects of executive functioning. Executive dysfunction might influence a reader's ability to set a purpose for reading, to monitor understanding and to integrate or make connections between information within the text or between the text and their own experiences or the world (Carnahan & Williamson, 2010; Carnahan et al., 2011). Keene and Zimmerman (2007) identify seven metacognitive skills and strategies used by competent readers as they interact with text: monitoring for meaning, using and creating schema, asking questions, determining importance, inferring, using sensory and emotional images, and synthesizing.

Meltzer (2007) argues that executive functioning plays an important role in reading comprehension tasks as they require that cognitive resources are dedicated to working on decoding and attending to meaning simultaneously in order to combine all information, and therefore require executive functioning skills. While reading, students need to use a number of executive functioning skills. To be able to comprehend, students need to be able to plan, organize and prioritize information, read for meaning, separate main ideas from details in text, think flexibly and monitor their progress.

Gioia, Isquith, Kenworthy and Barton (2002) completed a study regarding executive functioning and individuals with Attention Deficit/Hyperactivity Disorder (ADHD), Traumatic Brain Injury (TBI), Reading Disabilities (RD), and ASD. Parents of children with these diagnosed disabilities were the participants in the study. The groups examined consisted of: 151 boys and 57 girls in the control group, 21 boys and 13 girls in the RD group, 32 boys and 21 girls in the ADHD group, 50 boys and 17 girls in the TBI group and 47 boys and seven girls in the ASD group. Parents completed the Behaviour Rating Inventory of Executive Functioning (BRIEF), a rating scale with 86 items in eight non-overlapping but correlated scales reflecting commonly described domains of executive functioning.

While the ADHD, TBI and RD groups all showed areas where they struggled more than the control group, they also had domains where they demonstrated equal abilities with the control group. The ASD group was the only group that had elevated scores compared to the control group across all domains. The ASD group demonstrated greater difficulty than all other groups with shifting, using cognitive flexibility to access different linguistic information (orthographic, phonological, and semantic) and a weakness in self-monitoring. The study reported that ASD individuals showed problems with flexibility in everyday living and that 70% of the ASD group achieved clinically elevated scores for problems with planning and organizing. All of these deficits could be considered reasons why students with ASD struggle with reading comprehension.

Hyperlexia. Another characteristic found in many children diagnosed with ASD and weak reading comprehension skills is hyperlexia. Hyperlexia is a term used to describe individuals who decode words easily and read in a manner that sounds

appropriate (Newman et al., 2007). Many individuals with hyperlexia have a large

discrepancy between word-decoding capacities and comprehension of what is being read.

Hyperlexia has been known to occur in children with ASD as well as in children with

other developmental delays (Flores & Ganz, 2007). An occurrence of hyperlexia was

documented where a child began reading as early as two and a half years and writing at

18 months. In second grade, this same child demonstrated superior decoding skills and

reading fluency (at the 95th and 84th percentiles, respectively) but showed greatly

delayed reading comprehension abilities, at the 16th percentile (Craig & Telfer, 2005).

      While these students may be skilled at decoding, they are most often less skilled

at comprehending the texts they read (Nation et al., 2006; Randi et al., 2010). Although

word recognition skills and comprehension skills are correlated, they develop

independently of each other (Randi et al., 2010). Nation et al. (2006) found that for

students with ASD who had measureable reading skills (the ability to decode), more than

65% had comprehension difficulties. Hyperlexia can mask deficits in reading

comprehension for students with ASD as research shows that when assessing students

with strong word reading skills or abilities, educators often make the assumption that

students who can decode can also comprehend (Mirenda, 2003; O'Connor & Klein,

2004).

      Language impairments. Many children with ASD have language impairments.

Impairments with language skills place children with ASD at high risk for literacy failure

and, therefore, difficulties with learning to read can be expected (Bishop & Snowling,

2004). Nation et al. (2006) discuss that reading comprehension difficulties may come

from inadequate reading accuracy, stating that if a student is unable to recognize or

decode words they then cannot understand the intended meaning of those words.

However, they also noted that some children achieved a normal range for word reading

but were still impaired with reading comprehension. These children showed impairments

in vocabulary and oral language comprehension, which suggests that impairments in

reading comprehension accompany impairments in understanding language, more

generally (Bishop & Adams, 1990; Nation, Clarke, Marshall, & Durand, 2004). In their

2008 research, Geurts and Embrechts concluded that the students with ASD in their study

displayed impairments with pragmatics, communication and language structures.

Manolitsi and Botting (2011) also found that students with ASD have impaired receptive

and expressive language skills along with difficulties with language structures.

ASD and Reading Comprehension Handbook

If research shows there are identifiable reasons for students with ASD to struggle

with reading comprehension, there should be a handbook that addresses each of these

reasons and the strategies that may be beneficial for teachers and educators to use for

each of these areas of deficit. El Zein, Solis, Vaughn, and McCulley (2014) found that

modified instructional interventions were associated with improved comprehension for

students with reading difficulties and may improve reading comprehension in students

with ASD.

Reading comprehension requires readers to build a mental picture of the text

(Nation & Norburg, 2005) and what is described in the text (Kintsch & Rawson, 2005).

Readers must combine previous knowledge with information in the text to create a visual

scene (Kintsch & Rawson, 2005; Perfetti et al., 2005). Readers must make connections

between words in the text and their prior knowledge about the world to comprehend.

Building these visual scenes involves many different processes, such as making

connections between background knowledge and text.

The reasons a child with ASD may fail to comprehend are likely to be complex.

It is important to understand which aspects of reading comprehension a certain child finds

difficult in order to implement appropriate and well-targeted interventions for that child

(Nation & Norbury, 2005). Students with ASD can read but do not have full control over

the processes necessary for making meaning (Nation & Norbury, 2005). Educators must

understand that reading accuracy is not a guarantee of adequate reading comprehension.

Students with hyperlexia demonstrate that it is possible to decode and read fluently but

not understand what has been read.

The research available on students with ASD and reading comprehension support

the need for a handbook of reading comprehension strategies that may be useful for

working students with ASD. Brown et al. (2013) discuss that with the increase in the

number of students being diagnosed with ASD, and therefore the number of these

students in mainstream classrooms, more and more teachers may find themselves ill-

equipped to meet the complex needs of these learners. Randi et al. (2010) suggests that

given the wide range of strengths and weaknesses exhibited by students with ASD, there

is no single reading comprehension intervention that may be appropriate for all students

with ASD. They discuss that despite there being a number of studies on interventions for

teaching students with ASD there are surprisingly few interventions specifically for

reading comprehension that have been described in the literature. Most literature

examines instructional approaches rather than interventions that are targeted at specific

reading comprehension difficulties, the focus being on practicing skills rather than

teaching skills to help scaffold the cognitive processes involved in deriving meaning from reading (Randi et al., 2010). Randi et al. (2010) go on to state that they believe it is reasonable to assume that parents and educators will be looking to researchers to provide a wide range of interventions to target the individual needs of readers with ASD.

Whalon and Hart (2011b) stated that students with ASD might have later difficulties with reading comprehension due to a lack of targeted comprehension instruction earlier in their school careers. They believe that educators should emphasize explicit language and reading comprehension instruction in the beginning grades. Whalon and Hart (2011b) go on to state that by participating in direct and explicit comprehension strategy instruction, learners with ASD may learn a strategy that may help them to be able to access the general education curriculum in reading and may also give them the tools to engage in meaningful academic discussions with their peers.

In their second paper, Whalon and Hart (2011a) argued that many of the struggles with reading comprehension encountered by students with ASD may be due to the instructional focus in their classrooms. In some classrooms, there is a lack of focus on targeted reading comprehension strategy instruction, most reading instruction focuses on teacher-directed questioning that places the student in a passive role of responder as opposed to an active constructor of meaning. Whalon and Hart (2011a) went on to explain that it is imperative that readers with ASD are taught reading comprehension strategies that explicitly address how to interact with text. They acknowledge that for these strategies to be effective, there is a need for collaboration between general and Special Education teachers.

Koegel, Matos-Fredeen, Lang, and Koegel (2011) argued that the general education classroom is the least restrictive environment for students with ASD to learn. They questioned to what extent classroom teachers are prepared to implement behavior, communication and social interventions to help students with ASD. I believe you can pose this same question to ask to what extent these teachers are prepared to implement reading comprehension interventions to help students with ASD. With the increase in the number of students with ASD in general education classrooms increasing, classroom teachers are feeling growing pressure to ensure that all leaners comprehend text across all content areas (Carnahan & Williamson, 2016). Koegel et al. (2011) found that many teachers choose interventions based on their ability to easily implement them in the classroom, their own personal beliefs, the interventions perceived appropriateness for a certain student and the availability of materials and support staff that may be needed. These attempts at intervention may not be successful as they are teacher centered rather than being selected because they address a specific deficit or need that a student may have.

A handbook that outlines a variety of strategies for reading comprehension would be useful for classroom teachers to not only help their students with ASD but any other struggling readers in their classroom. While reading comprehension instruction has begun to receive growing attention, readers with ASD continue to experience poor academic progress (Carnahan & Williamson, 2016). Accarso, Finnegan, Gulkus, and Papay (2017) stated that their research supports the need for ongoing support for teachers of learners with ASD and ongoing professional development in the area of effective practices for teaching reading comprehension to students with ASD. If teachers are

unaware of the more than a few specific strategies to implement, a handbook may give them a wider variety of strategies to choose from, particularly if what they are currently trying is not working for a student. A handbook could also be used in the form of professional development to help instruct classroom teachers on the use of effective practice for teaching reading comprehension.

Chapter Summary

A great deal of literature is available about ASD, the reading process and what reading comprehension looks like for individuals with ASD. The literature defines ASD and discusses the recent changes in the way that ASD is now diagnosed. In reviewing the literature on the reading process and why students with ASD struggle with reading comprehension, it is apparent that a significant portion of students with ASD struggle with reading comprehension and that there is a need for a resource that outlines strategies that could be used in the classroom.

This chapter gave an overview of ASD, including the prevalence rates that 1 in 66 children and youth in Canada is now diagnosed with ASD. How the APA's diagnostic criteria changed in 2013 was discussed, along with the fact that the level of severity of symptoms that individuals experience was now being recognized and identified. The changes in the diagnostic criteria has encouraged earlier diagnosis and also allowed for more individuals who do not demonstrate symptoms until an older age to be diagnosed as well.

The reading process requires individuals to be able to understand the message being conveyed by printed text. We should read to understand and to be successful at this complex skill requires a number of processes: decoding, knowing the meaning of words,

analyzing syntactic and semantic structures, drawing on personal background knowledge, understanding the underlying meaning of text, and relying on metacognitive structures such as self-monitoring.

Research consistently confirms that students with ASD tend to struggle with reading comprehension and do not have homogenous reading profiles. There are common areas where individuals with ASD struggle with when it comes to reading comprehension. The specific reasons students with ASD struggle with reading comprehension include: theory of mind, weak central coherence, executive dysfunction, hyperlexia, and language impairments. Theory of mind refers to the ability to understand, empathize with, or make predictions based on the perspectives of others. Weak central coherence is when individuals attend to specific details rather than the overall gist of an event. Executive dysfunction refers to difficulties with functions such as planning, controlling impulses, working memory, shifting set, initiating and monitoring actions and inhibiting predominant responses. Hyperlexia is when an individual is able to easily read and decode words and read in a fluent manner. Students with hyperlexia are often assumed to be good readers because their reading sounds good but when comprehension is focused on it is discovered that they struggle in this area. Some individuals with ASD demonstrate impairments in vocabulary and oral language comprehension, which leads to difficulties with reading comprehension.

While I was able to find literature that discusses the struggles encounter by students with ASD when they read, which supports the premise that students with ASD tend to struggle with reading comprehension, much of this research focused on one or two specific areas of need and the strategies that would work for these areas of deficit

rather than identifying all the reasons students struggle and outlining a wide array of strategies. This is why I proposed to compile a handbook that outlines a number of strategies that could be used with students with ASD to help them develop reading comprehension skills.

It is important that educators understand the reasons behind the struggles students with ASD encounter when they are attempting to comprehend written text. While these students may have commonalities, it is important that educators look at each student individually as students with ASD, like their typically developing peers, are all individuals who will demonstrate differences in their strengths and weaknesses.

The literature indicates that to provide students with ASD the opportunity to be successful when comprehending written text, it is important for educators to identify and address their individual deficits and provide them with appropriate strategies to use. I created a handbook for classroom and special education teachers to use to support the students with ASD with whom they work.

Chapter 3: Research Design

When I began working on this project, my intent was to produce a handbook to help both classroom and Special Education teachers to support students with ASD with the development of reading comprehension skills. I also wanted to investigate whether there was a need for this handbook and whether it would be useful. This approach would have required me to find a number of classroom and Special Education teachers who would be willing to review the handbook and complete a questionnaire about its usefulness. I would have had live subjects and been required to get approval for the project. This idea became rather overwhelming when looked at from the perspective of completing an undefendable project.

At my supervisor's suggestion I looked at the idea of using qualitative content analysis (QCA) to examine what the key issues were that cause students with ASD to struggle with reading comprehension and then to address these key issues in the handbook with strategies for each. After spending some time thinking about what my intent was and what I wanted the end product to look like, I decided that this was a much more realistic and feasible approach.

On further reflection, I realized that as a beginning researcher it was to my benefit to pursue the QCA approach, as it is an unobtrusive approach, which would not require me to find and/or rely on live subjects/volunteers. I further rationalized this selected approach with the fact that I would be able to gather need information without being directly involved in the research gathering process and I could then analyze my data with objectivity, validity, and reduced bias while eliciting meaning from the data collected and drawing realistic conclusions (Bengtsson, 2016).

This chapter outlines the steps in my journey to begin to fill the void of resources for teaching reading comprehension skills to students with ASD. This chapter examines the research methodology I employed to complete my project: the unobtrusive research approach. I provide information as to why I chose this methodology and how the data collection impacted my research. Then I outline the research method that I used, qualitative content analysis (QCA), including the four-phase plan by Bengtsson (2016): decontextualization (preparation), recontextualization (preparation), organization, and reporting. I examine the strengths of QCA and why this method was chosen. Throughout this chapter, I will discuss the levels of the coding frame and how it evolved throughout the process of analysis of the data collected. The determined themes comprised the basis for the handbook - Thinking Beyond the Words: Strengthening Reading Comprehension for Students with ASD.

Methodology

Unobtrusive measures are methods that do not require the researcher to intrude in the research context or with the subjects under study. Unobtrusive methods can reduce the biases that may result from the intrusion of the researcher or the measurement instrument being used. Obtrusive measures are direct and participant observation requires that the researcher be physically present. This can lead the respondents to alter their behavior in order to look good in the eyes of the researcher. A questionnaire may be seen as interruption to a respondent's daily routine and respondents may get tired of filling out a survey or resentful of the questions asked. Respondents may be uncomfortable if they feel they are being asked to disclose sensitive or distressing personal information.

Another benefit of unobtrusive research is that it can be relatively low-cost compared to other methods. In QCA, "participants" are generally inanimate objects as opposed to human beings and researchers may be able to access data without having to worry about paying participants for their time. In other types of research, the researcher may feel the need to compensate participants in some way for agreeing to participate in the study. In some studies there is a cost involved in mailing surveys or questionnaires to participants and in providing them with envelopes and stamps to return the survey or questionnaire. As well, other studies see researchers providing travel costs (gas, food, hotels, etc.) for participants who are not local to where the research is being conducted.

Unobtrusive research is also less prone to mistakes. It is far easier to correct mistakes made in data collection when conducting unobtrusive research than when using other methods. Fortunately for unobtrusive researchers, going back to the source of the data to gather more information or correct some problem in the original data collection is a relatively straightforward prospect where it would not be for researchers using others methods (Schreier, 2012).

Method

As already mentioned, my research method was qualitative content analysis (QCA). Assarroudi, Nabavi, Armat, Ebadi, and Vaismoradi (2018) and Bengtsson (2016) defined QCA as a method used to analyze data and interpret meaning. When I began looking into QCA it became apparent that it would be an appropriate method to use as it is systematic, objective, and flexible (Assarroudi et al., 2018). The structure of QCA was appealing to me as a new researcher as it gave me a framework to follow (Bengtsson, 2016; Vaismoradi, Jones, Turunen, & Snelgrove, 2016). I took all of the research I had

compiled and summarized/coded it to look for themes or commonalities that would answer my initial research question. This allowed me to interpret the meaning of the many articles I had read. QCA also provided me the flexibility to change my coding frame as new interpretations arose in the course of my research.

Both inductive reasoning, which is more open ended and exploratory, and deductive reasoning, which is narrower in nature, were used in my research (Bengtsson, 2016). My project is inductive and supported by my extensive literature review. It was also deductive, using extensive existing knowledge.

The goal of this project was to create a handbook for classroom and special education teachers that included the key issues students with ASD struggle with when trying to comprehend printed materials and strategies that could help teachers address these issues with the hope it would help students with ASD develop better reading comprehension skills. The deductive approach helped me get the general sense that this was an important area in education that needed to be addressed. The inductive approach, which is systematic, objective and flexible allowed me to develop a coding frame that I could use to create a handbook for classroom and special education teachers to use to help students with ASD develop their reading comprehension skills.

Data Analysis

In conducting my research, I followed the four-phase plan outlined Bengtsson (2016) and the three-phase plan outlined by Elo and Kyngas (2007): preparation, organization, and reporting out. Bengtsson's first two phases combine to be the first preparation phase of Elo and Kyngas's plan. These three phases fit with Assarroudi et al.'s (2018) 16 steps of directed content analysis.

Once my research question, "What are key issues for working with students with ASD who experience reading comprehension difficulties?" was formed, the first part of my project was the preparation phase where I accessed and selected relevant information and literature that pertained to my question and would be used for my project. I did this data collection (Elo & Kyngas, 2007) and began selecting my materials (Assarroudi et al. 2018) from the University of Northern British Columbia's Library website. Sixty-two articles, chapters, and books were read, highlighted, and coded.

The second part of my project was the organizational phase: categorization and abstraction, interpretation, and representativeness (Elo & Kyngas, 2007). The next step in the process was for me to develop a coding frame using Bengtsson's (2016) four steps of data analysis. A coding frame is when key phrases, words or patterns from the gathered research are recognized and organized into themes that can be applied to all research studies being used. The coding frame includes definitions or explanations if the codes will not be clear to the reader. The coding frame should be reviewed regularly as the researcher gathers information and will change and/or grow as the researcher completes the different stages of their research. The framework method has a number of advantages. It follows clear steps and produces highly structured outputs (Gale, Heath, Cameron, Rashid, & Redwood, 2013). The framework method does not accommodate highly heterogeneous data, meaning that the data collected must cover similar topics or key issues so that it is possible to categorize the data and it is most commonly used for thematic purposes (Gale et al., 2013), which suited the needs of my current research

I began with Bengtsson's (2016) first step, decontextualization, where the researcher familiarizes him or herself with the data by reading the gathered research and

identifying units of meaning that stand out. Each identified meaning unit is labeled with

a code. In the first cycle of coding while reading the selected literature, I highlighted

important points and wrote notes and key words in the margins of the printed documents,

using key words and phrases from my research question: ASD, reading comprehension,

and reasons why students with ASD struggle with reading comprehension. After I

compiled this coding list (Figure 1), I went on to Stage 2, recontextualization. After the

meaning units have been identified, the researcher then checks whether all aspects of the

content have been covered in relation to the research question being addressed. This is

where I reread the literature while focusing on the coding list using different coloured

highlighters to mark each code or "meaning" unit. I then examined the unmarked text to

determine whether or not it needed to be included. This is where I asked myself if

information was relevant or important. At this point in my reading, I recognized a fourth

level of coding: the reasons that students with ASD struggle with reading comprehension,

theory of mind, executive dysfunction, weak central coherence, hyperlexia, and language

impairments (see Figure 2). I saw that this information would be beneficial as a way to

divide the handbook into sections that would allow teachers to use specific strategies that

address the specific difficulty that each student with ASD was having with reading

comprehension.

Next, I went on to Bengtsson's (2016) third stage, categorization. Themes and

categories are identified in this step and the collected data is organized into these themes

or categories. As I reread the literature yet again, I continued to identify themes and

categories that pertained to my research question. This was where I added a fifth level of

coding, the strategies that were suggested or researched in the literature that was reviewed (see Figure 3).

The use of the QCA method permitted me to examine ASD and reading comprehension difficulties extensively and to identify the specific areas of difficulties that different individuals with ASD may experience. From there, it allowed me to examine and compile a list of strategies that have been trialed or suggested (based on research) to be used with individuals with ASD to help them acquire stronger reading comprehension skills (see Table 1).

Fifty-three articles were read, highlighted and coded. Three of these articles were not used as they did not fit into any of the coding categories or subcategories. At the start of my research I expected to find little explanation for the reasons why students with ASD struggle with reading comprehension but was pleasantly surprised to find that over half the articles I used touched on one or more of the reasons for the difficulties and that there was a great deal of overlap between the articles.

The search for information was stopped at fifty-three articles, chapters and books. I began to see that I was not finding any further information. I was also concerned that some of the further articles I was finding were older and that with the changes in the diagnosis and prevalence rates of ASD, along with the newer perspective on how these students function in the classroom based on newer models of inclusion, the information may not be current enough to be valid within the scope of my project.

As I was attempting to use my modified coding frame, I realized that it would be important to identify the specific areas of deficits that students with ASD experience with reading comprehension as all of my prior knowledge about individuals with ASD lead me

to believe that reading comprehension would be another area where I could not make the assumption that all learners with ASD are the same. This shifted my thinking to look at the outlined reasons for reading comprehension deficits and helped me further develop the outline for my handbook. This shift brought my focus back to the end purpose of my project, to produce a handbook for teachers to help students with ASD develop reading comprehension skills. During my next modification, I added reading comprehension strategies to my coding frame to ensure that I was including all the strategies that I had discovered in the course of my research.

The third part of my project was the reporting phase (Elo et al., 2014). This phase included the reporting of results and the analysis process. Using my research, I constructed a handbook for classroom and special education teachers. Through QCA, I was able to present teachers with evidence and a research-based summary of the difficulties students with ASD face when attempting to comprehend written texts and what appropriate interventions and strategies that they could implement in the classroom or in learning settings to help students with ASD comprehend written texts.

Conclusion

This chapter outlined the steps taken from the beginning of this project to the end project, the handbook. The chapter began by explaining the type of research methodology used, unobtrusive measures, and then my rationale for the selected method was examined. Unobtrusive measures were selected as they have a number of benefits when it comes to QCA. Unobtrusive measures allow the researcher to remain neutral and prevent the researcher from unintentionally influencing the measurements being used in

the study. These types of measures are also low cost and are forgiving when mistakes are identified and need to be rectified.

Next, I discussed the method, qualitative content analysis (QCA) that was used to analyze the data collected and to interpret the meaning of the data. QCA is a systematic, objective, and flexible method that provides a framework for the researcher to follow which is beneficial to a beginning researcher. I followed the three-stage plan: preparation, organization, and reporting as outlined by Elo et al. (2014) and Assaroudi at al. (2018). Within this three-stage plan I used Bengtsson's four-phase plan that broke the first stage of Assaroudi et al. (2018) and Elo et al. (2014) into two parts: decontextualizing and recontextualizing. In the first stage I used my research question to help me access and select relevant literature and then I familiarized myself with the data. At this stage I identified 3 levels of themes or codes: to support individuals with ASD in their acquisition of reading comprehension skills, ASD and reading comprehension, and why do individuals with ASD struggle with reading comprehension. After I identified these three levels of meaning, I reread the literature looking for further levels of meaning that I had missed. At this point I identified a fourth level of coding, the reasons identified as why students with ASD struggle with reading comprehension: theory of mind, executive dysfunction, weak central coherence, hyperlexia, and language impairments. When I moved onto Bengtsson's (2016) third stage categorization I identified a fifth level of coding, strategies to support reading comprehension development in students with ASD.

Lastly, QCA allowed me to develop a coding frame with five levels based on the theses themes/categories that arose from my investigations. This allowed me to develop
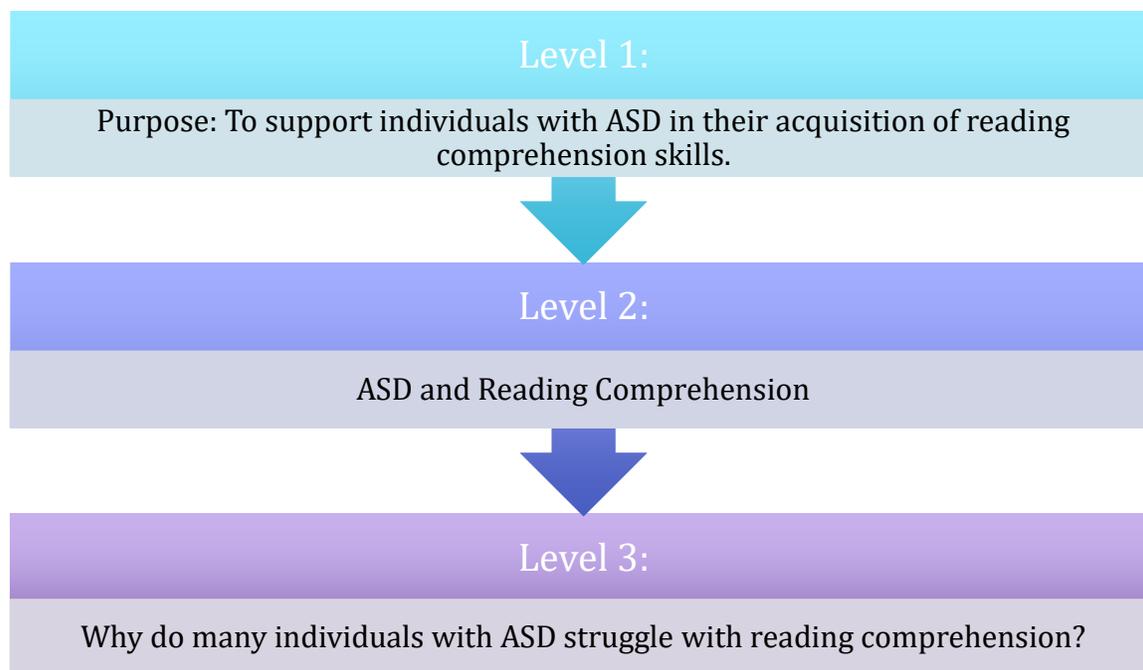
an outline for my handbook, *Thinking Beyond the Words: Strengthening Reading*

Comprehension for Students With ASD, that I felt would be easy to use and very useful

for teachers.

Chapter 4: Results, Discussion, and the Handbook

As a Learning Support Teacher, I have seen first hand the growing need and desire by classroom teachers to have readily available information to help them plan for the success of the students in their classroom, including those with ASD. Colleagues at the school I work often ask for advice on where to go next with their students with ASD when working on reading comprehension, and while I genuinely enjoy supporting these teachers and working with them as a team, I am only one person who cannot be all places at once. With the shift in education to inclusive classrooms, there is more and more need for this support for teachers and so the need for the handbook to provide reading comprehension strategies for teachers to use with students with ASD has become a necessity.

In this chapter, I will outline the results from the QCA analysis as discussed in Chapter 3.   I will then discuss why I ordered the chapters in the handbook as I did so there is a clear rationale for that order. Lastly, I will present the 63-page, research-based handbook, *Thinking beyond the words: Strengthening reading comprehension for students with ASD*. It was designed primarily with elementary school teachers in mind; however, I believe that educators working in all grades will find the handbook useful.

I developed the handbook with research at the forefront. The themes that are the basis of the handbook emerged through the use of qualitative content analysis (QCA), which is systematic, objective, and flexible. Taking into considering the themes derived from the literature, ASD and reading comprehension, why students with ASD struggle with reading comprehension, hyperlexia, theory of mind, executive dysfunction, weak central coherence, language impairments, and strategies to help students who have

Level 1:
Purpose: To support individuals with ASD in their acquisition of reading comprehension skills.

Level 2:
ASD and Reading Comprehension

Level 3:
Why do many individuals with ASD struggle with reading comprehension?

Figure 1. Initial coding frame for *Thinking Beyond the Words: Strengthening Reading Comprehension for Students with ASD.*

deficits in each of these areas, the handbook can help teachers implement strategies to assist their students with ASD develop reading comprehension skills.

In the first stage of research, decontextualizing, I identified three levels of themes or codes and added them to my coding frame: the purpose of the study, ASD and reading comprehension, and why individuals with ASD struggle with reading comprehension (see Figure 1). When I completed the second stage, recontextualizing, I identified and added a fourth level to the coding frame. This fourth level identified the reasons that students with ASD were struggling with reading comprehension that researchers were discussing in their literature: theory of mind, executive dysfunction, weak central coherence, hyperlexia, and language impairments (see Figure 2). In the third stage, categorization, a fifth level of coding was added. This level of coding was identified as the strategies that
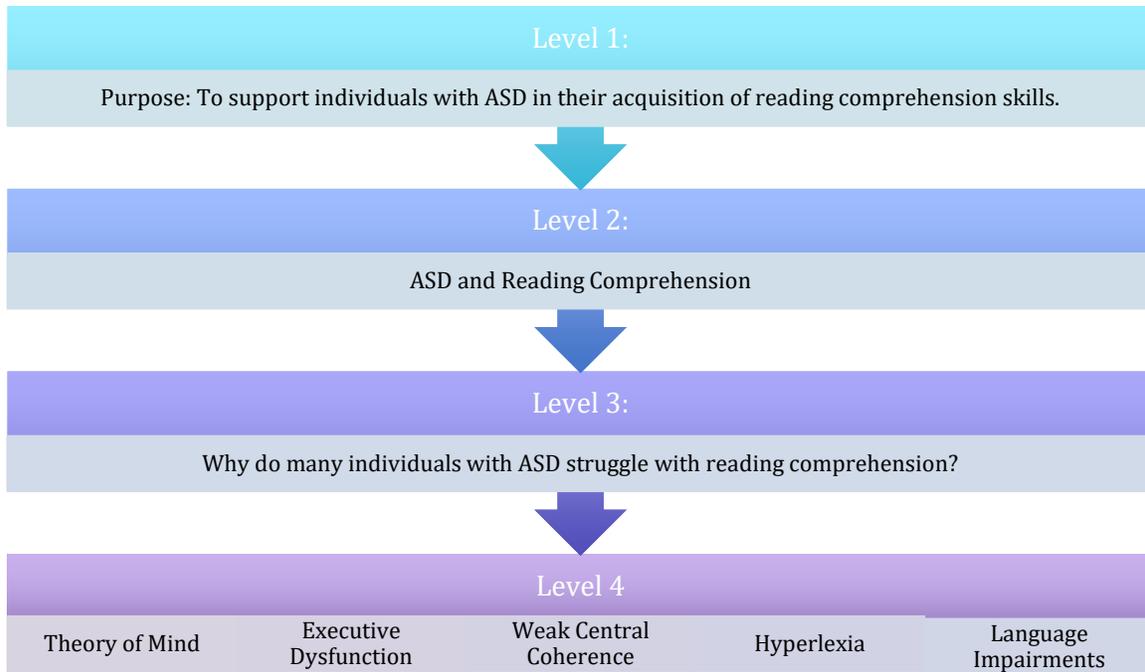
Level 1:
Purpose: To support individuals with ASD in their acquisition of reading comprehension skills.

Level 2:
ASD and Reading Comprehension

Level 3:
Why do many individuals with ASD struggle with reading comprehension?

Level 4				
Theory of Mind	Executive Dysfunction	Weak Central Coherence	Hyperlexia	Language Impairments

Figure 2. Modified coding frame for *Thinking Beyond the Words: Strengthening Reading Comprehension for Students with ASD.*

Level 1:
Purpose: To support individuals with ASD in their acquisition of reading comprehension skills.

Level 2:
ASD and Reading Comprehension

Level 3:
Why do many individuals with ASD struggle with reading comprehension?

Level 4				
Theory of Mind	Executive Dysfunction	Weak Central Coherence	Hyperlexia	Language Impairments

Level 5
Strategies to support areas of deficit

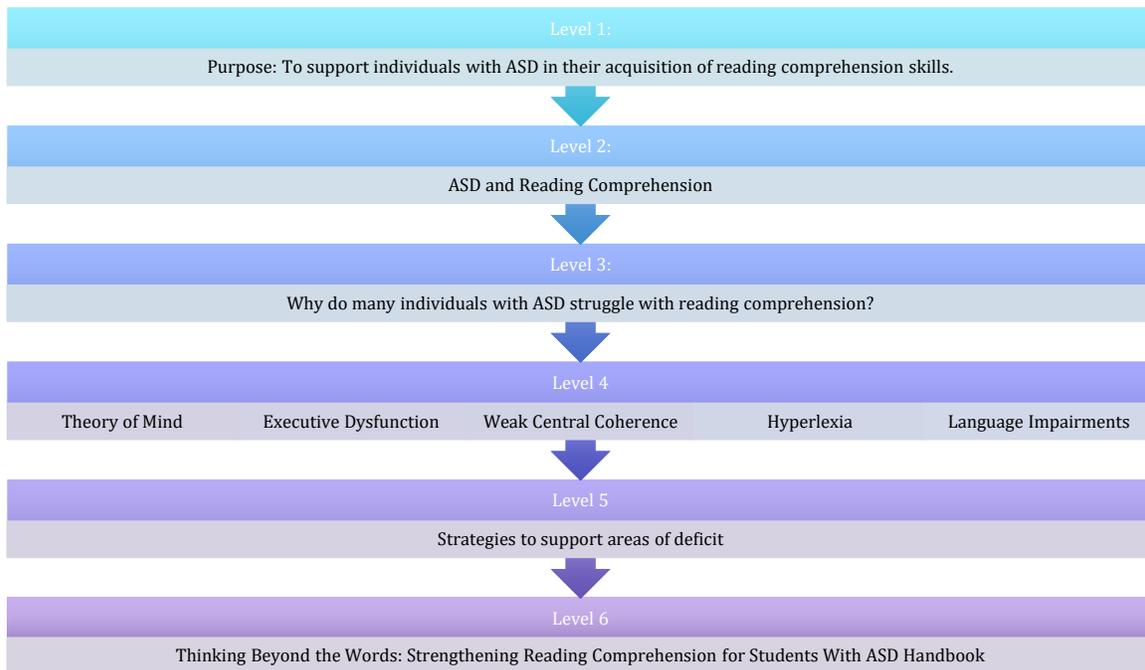| Level 6 |
|---|
| Thinking Beyond the Words: Strengthening Reading Comprehension for Students With ASD Handbook |

Figure 3. Second modified coding frame for *Thinking Beyond the Words: Strengthening Reading Comprehension for Students with ASD.*

Table 1

ASD and Reading Comprehension and Reasons why Students Struggle

Main categories from coding frame	Number of articles addressing area	Percentage of Articles Addressing Area
ASD and reading comprehension	28	.53
Why struggle with reading comprehension	19	.36
Theory of Mind	12	.23
Executive Dysfunction	13	.25
Weak Central Coherence	10	.19
Hyperlexia	18	.34
Language Impairments	21	.40
Strategies	15	.28
TOTAL	136	

were suggested or researched as being useful for teachers to use to help students with

ASD develop reading comprehension skills (see Figure 3).

I reviewed 53 articles and the data that was collected from each was collated into

a table that shows how many articles addressed the individual themes or codes that were

identified on the coding frame (see Table 1). Although 28 of the cited works addressed

the issue of ASD and reading comprehension, only 19 of them looked at why students

with ASD struggle with reading comprehension. The reasons that I identified as specific

to why students with ASD struggle with ASD reading comprehension varied in the

number

Table 2

ASD and Research Design Background Research

Area of Research	Number of research articles in each area
ASD and reading comprehension	28
Why struggle with reading comprehension	19
Theory of Mind	12
Executive Dysfunction	13
Weak Central Coherence	10
Hyperlexia	18
Language Impairments	21
Strategies	15

of articles that addressed each. I examined 21 articles that discussed language

impairments while weak central coherence only appeared in 10.

Table 2 shows the number of cited works that were used for background

knowledge or research design and were therefore not included in the coding frame.

While the purpose of the handbook is to explain the reasons that students with ASD

struggle with reading comprehension and to outline strategies that may be used to help

students develop their reading comprehension skills, there was a great deal of background

research that was completed in order to complete the handbook. It was important to be

able to provide educators current information on ASD, including prevalence rates, and to outline the research process that was used to compile the information for the handbook to ensure the handbook is considered valid.

The handbook is written in clear language that can be easily understood by teachers. The handbook provides teachers with information on why students with ASD struggle with reading comprehension and why the use of a reading assessment that has a component to do with reading comprehension is very important. The handbook then provides teachers with strategies that they can teach to help students with ASD with reading comprehension, depending on the area or areas where they struggle. The final part of the handbook includes a list of reading assessment, graphic organizer and strategy resources that teachers may find useful.

The handbook is organized into three sections. The information that was compiled in the coding frame was used to identify the three sections used in the handbook. In the process of completing research and compiling information from the research into the coding frame, it became apparent that it was important to ensure that educators understand what ASD is and to explain in detail how and why these students may struggle with reading comprehension. In Part 1, *Reading Comprehension and Autism Spectrum Disorder*, I attempt to assist teachers in understanding the prevalence of ASD, what reading comprehension is, and what reading comprehension looks like for students with ASD. The information in the coding frame that was collected under the category ASD and reading comprehension was utilized in this part of the handbook. Part 2, *ASD and Reading Comprehension Struggles*, examines the five areas that the research literature identified as being why students with ASD struggle with reading

comprehension: hyperlexia, theory of mind, executive dysfunction, weak central coherence, and language impairments. These five areas were identified in the research and included as categories in the coding frame as they reoccurred in the research discussing the reasons students with ASD struggle with reading comprehension multiple times. Part 3, *Strategies for specific deficits*, details a number of strategies that teachers may try for each of the areas identified as being why students with ASD struggle with reading comprehension. These strategies were compiled from the research that outlined what strategies may work best to help students with ASD develop their reading comprehension skills.

Part 1: Reading comprehension and Autism Spectrum Disorder. This section of the handbook introduces the handbook and explains why it was written. As well, it discusses what the literature examined during the QAC process states about the prevalence of ASD and the steady increase in the number of students receiving this diagnosis. These numbers support the need for teachers to develop more skills to aid their work with students with ASD as the number of students with ASD in inclusive classrooms are on the rise. The section goes on to explain what the literature states about reading comprehension. This section references current and up to date literature in the field of ASD and reading comprehension and helps highlight the need for the handbook to support teachers and help to provide meaningful literacy experiences for their students with ASD.

Part 2: ASD and reading comprehension struggles. This section of the handbook begins with an introduction to the premise that students with ASD generally struggle with reading comprehension. The current literature is discussed along with the

consensus amongst researchers that students with ASD have impaired reading comprehension skills. This section of the handbook is broken into the five areas of deficits that students with ASD may have when it comes to reading comprehension, based on the research examined in Chapter 2. Each area of deficit, theory of mind, executive dysfunction, weak central coherence, hyperlexia, and language impairment, is outlined in a subsection, using the literature used in the QCA to explain the deficit and how it may impact a student's comprehension skills.

Part 3: Strategies for specific deficit. In the introduction to this part of the handbook, the importance of using reading assessments to determine a students reading comprehension abilities is discussed. Skills, strategies and concepts are differentiated and the need for teachers to have the ability to address a range of diverse learners is emphasized. Each area of possible deficit is briefly introduced followed by suggested strategies. Each strategy is explained and the steps are outlined to help teachers implement the strategies. Suggested resources are also given.

Thinking Beyond the Words will help teachers understand ASD and the difficulties students with ASD have with reading comprehension. The handbook will give teachers the knowledge to understand why students struggle with reading comprehension and what they as educators can do to help their students develop this critical skill.

Thinking Beyond the Words:
Strengthening Reading Comprehension for Students with ASD
Handbook

Dedication

This handbook is dedicated to Everett and Wyatt and their amazing mother, Tammy. I can't thank the three of you enough for all you have shared with me and taught me! Thank you for the smiles, the laughter, the tears, and the tremendous learning journey that we have shared. This handbook really started with you all in mind! I hope to continue along this learning path with you for many more years!

Acknowledgements

Handbook Summary

This handbook is to assist classroom and special education teachers in working with students with ASD to develop reading comprehension skills. This handbook provides information about reading comprehension and why students with ASD often struggle with reading comprehension. The handbook discusses best practices for teaching reading comprehension to students with ASD. Lastly, this handbook outlines strategies to use to help students develop their abilities to make connections, to activate background knowledge, to visualize while reading, and to question text.

This handbook was developed as a result of many years working in Special Education and my personal experiences working with a number of students with ASD. I found that much of the research available and the suggested strategies were not thorough or comprehensive and honestly just weren't working for me. It is my sincerest hope that the process of writing this handbook will help me assist my students in being more competent at comprehension and that this will open a whole new world for them!

Table of Contents

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Part One:
Autism Spectrum Disorder and Reading Comprehension

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Introduction

In Canada more and more children are receiving a diagnosis of Autism Spectrum Disorder (ASD). Approximately one in 66 children and youth are diagnosed with ASD in Canada (Public Health Agency of Canada (PHAC), 2018). ASD occurs in all racial, ethnic, and socio-economic groups (PHAC, 2018). The prevalence of ASD has increased by over 100% in the last 10 years and ASD is now the fastest growing and most commonly diagnosed neurological disorder in Canada (Humphrey, 2018). With this increase in diagnoses, educators are seeing an increase in the number of students in general education classes who are diagnosed on the spectrum (Carnahan & Williamson, 2016). In my own personal experience as a classroom and special education teacher, the numbers of students I work with who have received or are waiting for an autism assessment are on the rise.

Students with ASD present with varied ability levels in all school subjects much like their typical peers. There has been significant research done on students with ASD and reading comprehension. It is commonly reported that many students with ASD struggle with comprehension, mainly due to the fact that people with ASD often struggle with integrating language, social understanding, and the emotional intent of messages. (Autism Speaks, n.d.). Many students with ASD have deficits in language and social cognition and difficulty interpreting and labeling each of these aspects of communication to gain meaning. The ability to understand and interpret various cues is necessary for effective comprehension of narrative texts. Some research reports that some students with ASD are good readers when it comes to decoding, however, they struggle with comprehending the materials they read (Frith & Snowling, 1983; Nation, Clarke, Wright, & Williams, 2006).

Reading Comprehension

Reading is defined as a cognitive process in which symbols are deciphered to arrive at meaning. Reading is more than letter recognition. Through this cognitive process information is organized into patterns, which are then recognized and connections are made. This information is then processed, resulting in the comprehension of the meaning of the written text (Norris, 1998). Reading comprehension is the mental process that allows the reader to understand the text. Reading is fundamental to helping individuals find and convey information and is a necessary skill as it helps people to discover new things, to develop the mind and imagination, and to improve both written and spoken communication. Having good reading skills allows individuals to develop good self-images. Students who do not have good reading comprehension skills often struggle with academics (Akbasli, Sahin, & Yaykiran, 2016; Knight & Sartini, 2014).

The purpose of reading is to get meaning from text. Without comprehension, reading is just an exercise in recognizing words on a page. Students need to be able to not only identify words but to process those words to understand the meaning being conveyed by those words. Reading comprehension is the cornerstone for understanding much of the information that is presented in classrooms. Whether participating in subject areas ranging from Social Studies to Science, students benefit from having strategies to rely on to help them understand printed material (Akbasli et al., 2016; Neufeld, 2005).

The end goal of reading is to understand messages conveyed by text (Ricketts, 2011). Reading comprehension is a complex skill that requires the use of a number of cognitive processes. Simply being able to read words and texts accurately is not sufficient for reading comprehension (Ricketts, 2011). Researchers have identified that to comprehend, students must know the meaning of words and be able to analyze syntactic and semantic structures of word combinations, draw on personal background knowledge, understand the underlying meaning of text and rely on metacognitive structures such as self-monitoring. Randi, Newman, and Grigorenko (2010) also stated that to demonstrate competent reading comprehension skills, students must demonstrate the ability to use two forms of processing. A reader must be able to identify words and engage language-processing mechanisms to assemble words into messages (Perfetti, Landi, & Oakhill,

2005). These processes allow readers to understand word meanings in appropriate context, to analyze a string of words and provide the underlying meaning of sentence information into more complete representations of extended text (Perfetti et al., 2005). Successful reading comprehension needs both sets of processes to operate adequately (Hoover & Gough, 1990; Nation & Norbury, 2005; Perfetti et al., 2005).

Part Two:
ASD and Reading Comprehension Struggles

Introduction

There appears to be a broad agreement within the research on reading comprehension and students with ASD that children with ASD have impaired reading comprehension levels (Frith & Snowling, 1983; Nation et al., 2006;). While there is evidence that some students with autism can read accurately, even amongst those students, there is evidence that levels of reading comprehension are poor (Frith & Snowling, 1983; Minshew, Goldstein, & Siegel, 1994). In a landmark study, Frith and Snowling (1983) examined reading comprehension in students with autism and dyslexia. Their research was comprised of three groups: (a) six boys and two girls, aged 9 to 17 with classic symptoms of autism: (b) eight boys, aged 10 to 12 who were deemed to be dyslexic and were referred for their poor reading skills for their age and IQ: and (c) eight boys and two girls, aged 9 to 10 with average reading abilities. The groups were matched based on their results on the British Abilities Scale (BAS) Word Reading Test where single words were read aloud. After the students were matched, the Neale Analysis of Reading Ability (NAR) was administered, which required students to read aloud a short story and to answer questions about the story. Frith and Snowling's results showed that when the students with autism were compared to the group with dyslexia, the students with autism performed at similar levels in terms of reading accuracy, however, the students with autism achieved significantly lower scores for reading comprehension than the students with dyslexia.

Nation et al. (2006) investigated patterns of reading ability in a sample of 41 children with ASD, through an assessment of four components of reading skill: word recognition, nonword decoding, text reading accuracy and text comprehension. The results emphasize the heterogeneity of reading skills in children with ASD. While a total of nine children were unable to read at all, 20 children achieved word-reading levels in the average or above average range, however, 10 of these children were found to have impaired reading comprehension as well as impairments in vocabulary and oral language comprehension. Overall, the majority of children in the sample showed a discrepancy between reading accuracy and reading comprehension. In 10.3% of the sample, the

comprehension score was significantly below their reading accuracy score and a total of 65% of the sample showed poor reading comprehension. These results would seem to suggest that while many children with ASD develop age- appropriate word reading skills, reading comprehension does not develop parallel to these other skills.

The sample size in the Nation et al. (2006) study may be viewed as being too small to use to generalize the results to a wider population. In response, Huemer and Mann (2010) set out to establish a comprehensive profile of decoding and comprehension skills within a larger sample of 384 children with ASD. They attained this sample through 41 private nationwide learning centers in the United States of America and one from the United Kingdom. These centers provide one-to-one reading and comprehension instruction for children with learning disabilities or developmental disorders. The sample consisted of three groups: 171 children with autism (mean age 10.41 years), 119 with PDD-NOS (Pervasive Developmental Disorder Not Otherwise Specified - mean age 10.08 years) and 94 children with a diagnosis of Asperger Syndrome (mean age 11.37 years). All children in the sample were able to communicate verbally and had measurable reading abilities. The researchers also included a comparison group of 100 children with Dyslexia (mean age 11.21 years). The researchers were not able to include a comparison group of typically developing children, however, they used standard scores as a way of making a comparison to population norms. The data analyzed consisted of a battery of nine standardized measures of decoding, word recognition and reading comprehension (including both oral and written tasks) administered when children enrolled in the learning centers. Using the outcomes from the previous study by Nation et al. (2006), the researchers predicted that the children with ASD (all groups) would achieve lower scores on all reading comprehension measures that those with Dyslexia. They also predicted that the students with Dyslexia would score lower on measures of decoding and word recognition than the ASD group. The study's findings confirmed the researchers' predictions and provided further support for the presence of impaired comprehension skills relative to decoding skills in the ASD population.

Minshew et al. (1994) looked at 54 individuals with high functioning autism and compared them with 41 typical functioning peers. The subjects' academic achievement was measured using portions of Detroit Tests of Learning Aptitude-2, the Woodcock

Reading Mastery Test and the Kaufman Test of Educational Achievement. Minshew et al. (1994) hypothesized that the subjects with autism would not differ from the control subjects on subtests assessing mechanical and procedural skills but would differ on subtests measuring comprehension and interpretive skills. The researchers concluded that the subjects with autism performed significantly less well that the control subjects on the comprehension tasks. Research indicates that within these classrooms, a large portion of students with ASD demonstrate difficulties with reading comprehension.

Minshew, et al. (1994) and Frith and Snowling (1983) discuss that when students with autism were matched with typically functioning students relative to IQ, students on the spectrum performed less well on reading comprehension tasks than the typically functioning students, despite being well matched in terms of reading accuracy. O'Connor and Klein (2004) stated that reading comprehension is impaired but not completely lacking in students with ASD, and further research confirms there are a number of reasons that students with ASD struggle with reading comprehension.

Five areas have been identified as being key issues for students with ASD when it comes to reading comprehension; theory of mind, executive dysfunction, weak central coherence, hyperlexia, and language impairments. It is important for teachers to know their students and take their time to complete accurate reading assessments to get a good sense of where their students are struggling. As stated by Randi et al. (2010) students with ASD exhibit a range of strengths and weaknesses indicating that one single reading comprehension intervention may not be appropriate for all students with ASD. Once a teacher has completed the assessment, they can look at where to intervene depending on which areas the student is struggling with.
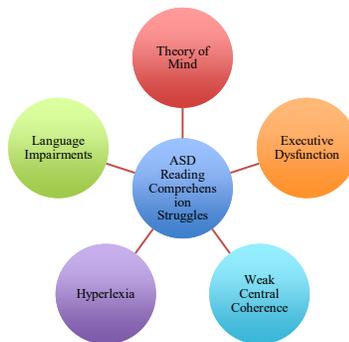

Figure 1: Key Issues in Reading Comprehension for Students with ASD

Hyperlexia

A number of students with ASD display hyperlexia, the ability to decode words easily and read in a manner that sounds appropriate (Newman et al., 2007). While these students may be skilled at decoding, they are most often less skilled at comprehending the texts they read (Randi et al, 2010; Nation et al., 2006). While word recognition skills and comprehension skills are correlated, they develop independently of each other (Randi et al., 2010). Nation, et al. (2006) found that for students with ASD who had measureable reading skills, more than 65% had comprehension difficulties.

Theory of Mind

In their 1985 paper, Baron-Cohen, Leslie and Frith proposed one of the most prominent cognitive theories for people with ASD. They proposed that individuals with ASD fail to acquire an intuitive "theory of mind" that typically develops between the ages of four and six years old. Theory of mind is the ability to understand, empathize with or make predictions based on the perspectives of others. Baron-Cohen et al. (1985) identified that children with ASD, compared to typically developing peers, are impaired in their understanding of metal states and experience greater difficulty attributing mental states to themselves and others.

Considering that books written for children contain many references to metal states, it is not surprising that students with ASD experience reading comprehension difficulties when they are expected to use the theory of mind to understand the thoughts, behaviours and motives of characters. If the attribution of mental states is a requirement to understand simple childhood books, deficits in theory of mind may have a significant impact on the ability of those with ASD to comprehend stories. Individuals with ASD may struggle with reading comprehension because they struggle to understand characters perspectives, to make inferences about the motives and behaviours of characters, or to make accurate predictions (Carnahan & Williamson, 2010; Carnahan, Williamson, & Christman, 2011).

Weak Central Coherence

Frith (1989) first used the term *weak central coherence* to refer to when individuals attend to specific details rather than the overall gist of an event (Happé & Frith, 2006). Frith used central coherence to refer to the ability of typically developing individuals to process information by understanding the bigger picture rather than remembering every specific detail. For individuals with ASD, Frith proposed that they had weak central coherence, a processing bias for remembering specific details at the expense of extracting the gist and contextual meaning. Readers with ASD may focus on minute, and possibly insignificant, details in text rather than on the bigger picture. This challenges their ability to comprehend and store pertinent information. As suggested by Randi et al. (2010), and Carnahan and Williamson (2010), while understanding words and sentences is important for comprehension, it is possible to understand the meaning of a word or sentence and not understand the message being conveyed by the entire text. Readers with weak central coherence may be able to decode words or understand specific vocabulary but may not understand the meaning of the text in its entirety.

Reading comprehension is dependent on integrating information from within the same text and from prior knowledge or external knowledge in order to establish meaning (Nation & Norbury, 2005). The idea of weak central coherence presents an explanation of how cognitive characteristics of individuals with ASD may contribute to difficulties with comprehending written texts. A predisposition to focus on specific details combined with the tendency to struggle with combining information to form a coherent whole, may contribute to difficulties with comprehending a written text for students with ASD. In other words, it is possible to understand at a word or sentence level without understanding what the message the text is conveying in its entirety.

Executive Dysfunction

Executive functioning includes functions such as planning, controlling impulses, working memory, shifting set, initiating and monitoring actions and inhibiting predominant responses (Hill & Frith, 2003). Many studies investigating executive functioning in individuals with ASD (Hughes, Russell & Robins, 1994; Ozonoff & Jensen, 1999) reported significantly impaired performance on tasks designed to measure

particular aspects of executive functioning. Executive dysfunction might influence a reader's ability to set a purpose for reading, to monitor understanding and to integrate or make connections between information within the text or between the text and their own experiences or the world (Carnahan & Williamson, 2010; Carnahan et al., 2011). Keene and Zimmerman (2007) identify seven metacognitive skills and strategies used by competent readers as they interact with text: monitoring for meaning, using and creating schema, asking questions, determining importance, inferring, using sensory and emotional images, and synthesizing.

Language Impairments

Many children with ASD have language impairments. Impairments with language skills place children with ASD at high risk for literacy failure and, therefore, difficulties with learning to read can be expected (Bishop & Snowling, 2004). Nation et al. (2006) discuss that reading comprehension difficulties may come from inadequate reading accuracy, stating that if a student is unable to recognize or decode the words they then cannot understand the intended meaning of the words. However, they also noted that some children achieved a normal range for word reading but were still impaired with reading comprehension. These children showed impairments in vocabulary and oral language comprehension, which suggests that impairments in reading comprehension accompany impairments in understanding language, more generally (Bishop & Adams, 1990; Nation, Clarke, Marshall, & Durand, 2004). In their 2008 research, Geurts and Embrechts conclude that the students with ASD in their study displayed impairments with pragmatics, communication and language structures. Manolitsi and Botting (2011) also concluded that students with ASD have impaired receptive and expressive language skills along with difficulties with language structures.

Part Three: Strategies

Introduction

It is important for teachers to understand each student as an individual. Not all students with ASD have the same characteristics or deficits. In order to determine what strategies a student needs to work on in order to develop their ability to comprehend text, it is important that a reading assessment is completed. No matter what assessment is used, whether it be the PM Benchmarks (Smith, Dale, & Randell, 2003), DRA2+ (Beaver & Carter, 2002) or another assessment tool, it is essential that teachers analyze the information presented in the assessment to determine where a student's strengths and weaknesses lie. In addition to that, it is essential that the assessor determine the student's level of comprehension of the story. Nation et al. (2006) state that good word reading ability does not guarantee that a student has adequate comprehension. If a child can decode the story but is unable to answer any questions or only retells the story with minimal information or details the teacher should consider using a lower level text to find where a student is able to demonstrate comprehension. These assessments should be used to determine why the student is struggling and then the appropriate strategies can be addressed.

Effective reading teachers teach skills, strategies, and concepts. *Skills* are things students learn to do. In reading, students must learn skills such as associating letters with their sounds (such as saying the sound of the letter *b* and blending these sounds to form words [as in sounding out words). *Strategies* are routines or plans of action that can be used to accomplish a goal or work through some difficulty. Students can be taught strategies to use when they come to a word they don't know, such as looking at the picture, popping out the first sound and rereading or thinking about the meaning of the story. Finally, students must learn *concepts,* or ideas. They need background knowledge related to what they are reading and to the topics they are reading about, in order to comprehend the text they are attempting to read.

Meeting the needs of diverse readers is no small task. In a typical 4th grade classroom, there may be virtual nonreaders, typically developing readers, and students who read significantly above their grade level. Many classrooms in which all instruction

is delivered in English include students who are learning to read and speak in English at the same time. A single classroom may include children who speak several different languages at home. Teachers address these various needs by providing *differentiated instruction*, using the results of diagnostic assessments to help them identify students' strengths and needs, forming small groups of students with similar needs, and then planning instruction to target those needs. Typically, this means that teachers implement reading instruction in small groups as well as in whole class formats.

Although a quality-reading curriculum will provide the foundation for effective instruction, teachers will need to adapt their instruction for students who struggle (and for high-achieving students as well). Quality classroom reading instruction can be adapted for students who find it difficult to learn to read by: a) teaching the specific skills and strategies that students need to learn, based on assessment data; b) making instruction more explicit and systematic; c) increasing opportunities for practice; d) providing appropriate text at students' instructional reading levels (not too easy but not too hard); and e) monitoring students' mastery of key skills and strategies and re-teaching when necessary (Rosenshine, 2012).

Students with learning difficulties benefit from explicit instruction in decoding skills and strategies, fluency, vocabulary and word meanings and word-learning strategies, and comprehension strategies. When a teacher provides explicit instruction she or he clearly models or demonstrates skills and strategies and provides clear descriptions of new concepts. Students don't have to infer what they are supposed to learn. For example, a teacher who is explicitly teaching first grade students to use pictures for support when reading should demonstrate this process step by step, then provide opportunities for students to practice the skill with the teacher's feedback and support. If the student is not successful, the teacher models again. Eventually, the students apply the skill independently. Students who are easily confused are more likely to be successful when teachers demonstrate and clearly explain what they need to learn. On the other hand, if confusions are not addressed and foundational skills are not mastered, it is likely that students will become more and more confused, resulting in serious reading problems.

It is important that teachers ensure that there is ongoing assessment and monitoring of students comprehension skills. This allows students the opportunity to

work at an appropriate level and for the teacher to catch any changes to a student's progress (positive or negative) to make sure the teacher is providing the necessary supports.

Hyperlexia - Strategies to Develop Vocabulary Understanding

Hyperlexia is not a reason that students with ASD struggle with reading comprehension, but it can lead to the perception by teachers that the student has good comprehension skills. Hyperlexia can be viewed as a positive skill for students with ASD. Students with hyperlexia have a well-developed ability to decode words, and this is a skill teachers need to be cognizant of so that they do not mistakenly assume that a student with hyperlexia has good reading comprehension without assessment to back up their assumption. It is imperative that teachers use reading assessments to determine both the decoding and the reading comprehension abilities of individual students. This could mean that while a student is able to decode at one level the teacher may need to work with that student at a lower level where the student can easily decode but may have struggles with comprehension. Assessments will be useful to help teachers determine where a student may be struggling and what strategies would be most beneficial to try.

Students with ASD who demonstrate hyperlexia struggle with comprehension because they tend to lack background knowledge and the understanding of vocabulary. These students need help to develop background knowledge and to make connections. These students need help to create visual images that help them understand as they read.

There are resources available, such as *The Basic Reading Comprehension Kit for Hyperlexia and Autism* by Reese and Challenner (2005) that can help teachers support students with hyperlexia move beyond just being able to decode words and develop their comprehension skills. The authors provide specific activities that help students develop sight word comprehension and comprehension strategies.

Connections

As students with hyperlexia struggle with accessing background knowledge when reading, it is important for them to work on making connections between what they are reading and previous knowledge they may not readily understand they have. In order for students to understand what they are reading, it is very helpful for them to learn how to make connections between the text and their own knowledge and experiences, particularly when trying to comprehend a character's emotions, beliefs, thoughts and motivations. Making connections while reading helps the reader monitor his/her own

thinking, keeps him/her actively engaged while reading, and leads to an overall better understanding of the text. There are three types of connections that students need to learn about:

> 1) Text to Self: The reader connects what he/she has
>
> read to something in his/her own life.
>
> 2) Text to Text: The reader connects what he/she has
>
> read to something he/she has read previously.
>
> 3) Text to World: The reader connects what he/she has
>
> read to something he knows about the world.

When teaching readers about text to self-connections, the teacher needs to teach students to ask themselves questions such as:

- o   What from my own life does this remind me of?
- o   Which characters in this story can I relate to and why?
- o   How did I feel when I read this?

The teacher should scaffold this direct instruction by reading a story to the students and using the above questions the teacher should model how to answer the questions. Model that these questions can be asked at any point in the text such as after a sentence, a paragraph, a page, a chapter, or the whole book. Then encourage the student to answer the questions. It may take many examples and a lot of practice for a student to answer these questions on his/her own. A good resource for teaching making connections is Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read.*

Visualizing

Visualizing is a useful strategy for students with hyperlexia who may struggle with the understanding of vocabulary. When students use visualing, it helps them see the bigger picture of the story and incorporates the vocabulary they encounter as they read. Visualizing is when readers use their senses to form images or pictures of the story as they read. The teacher should model their visualizing as they read to the students, providing scaffolding to allow students to participate and share their visualizations. The next step sees the teacher reading to the students and stopping at pre-selected spots in the

book and recording what they are visualizing. After the story is finished, the teacher then reads the story showing the pictures and discussing with the students any similarities and differences their sketches may have with the pictures in the book. The teacher should gradually release this task to students, allowing them to orally discuss their visualizations with others or to record them on paper. The students should select a text at a just right reading level for them and use the text, stopping periodically, to sketch the images they have visualized while reading. A good resource for teaching visualizing Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read*.

Theory of Mind Strategies

Students with ASD need help learning to understand the social perspective of others. This difficulty transfers to reading comprehension when the student is reading a text that contains characters. Students need help to understand the thoughts, emotions, motivations, and perspectives of characters in text. As well, students need to be able to understand the author's intentions and the narrator's point of view. There are a variety of strategies that teachers can implement to help students in this area.

Graphic Organizers

Graphic organizers can be used to allow students to focus on the characters in the story. Students can be asked to identify the thoughts, emotions, motivations and perspectives of characters using the visual prompts on graphic organizers. Graphic organizers specific to character trait identification provide the visual structure that shows how information in a text is related to the characters. These graphic organizers allow students to connect what they know with new information from the text, which in turn helps them comprehend the text. There are many character trait graphic organizers available, both in many books dealing with reading comprehension and online. See Appendix for an example.

Anaphoric Cueing

Pronouns are the most common form of anaphora, a word that replaces or refers to a word used earlier in the text. The ability to produce and comprehend pronouns can be a barrier to understanding the perspectives of different characters and to comprehending text. Anaphoric cueing consists of strategies that assist readers to correctly understand pronoun referents. There are two strategies that appear to be effective for students with ASD, cloze design and the use of a specific graphic organizer.

Before using either strategy, the teacher should explain to students that there are short ways of saying things and provide examples. Hints can be given that the character a pronoun refers to is most likely found in the same or previous sentence. The teacher can use direct instruction where the teacher initially highlights the pronoun referents, and then

allows the student to help, eventually leading to the student attempting to identify the pronoun referent independently.

Cloze Strategies

Cloze strategies require the reader to fill in blanks or choose from a selection of names to identify the character that each pronoun refers to. Teachers should start with cloze examples that have three possible referents: one that is inappropriate, one that is syntactically correct but not relevant to the story, and one that makes sense. Example: "Nancy enjoys reading when she (Paula, Nancy, book) has a quiet place to sit." Teachers should scaffold this activity, making the complexity of the choices more difficult as the student demonstrates the ability to complete the tasks. Teachers should also select texts that allow them to provide specific practice. Students should be asked to identify the pronoun and then can be asked to identify whom the pronoun refers. These specific questions can be faded over time as the student demonstrates an increased skill in this area.

Graphic Organizer

A graphic organizer can also be used to help students with ASD to identify all pronouns referring to a particular character. Adding a graphic organizer to anaphoric cueing was found to be effective when used with texts that students were interested in (Carnahan & Williamson, 2016). Prior to reading the text, students are given the organizer to complete, identifying possible referents that would refer to the identified character (i.e. Nancy - her, she, you). The students are then asked to generate a question about the text that uses a pronoun (i.e. Where does she like to read?). Again, scaffolding should be provided to ensure that students are able to generate a question and then should be positively reinforced for completing the task. In text, characters emotions and thoughts are often shown so it is important for students to be able to identify referents in text.

Question- Answer Relationship (QAR)

Question-Answer relationship (QAR) can be used to have students respond to questions that pertain to the thoughts, emotions, motivations, and perspectives of characters in a text and is a strategy to be used after students have read. QAR teaches

students how to decipher what types of questions they are being asked and where to find the answers to them. Four types of questions are examined in the QAR. They include: *right there* questions which are literal questions whose answers can be found in the text; *think and search* questions which have answers that are gathered from several parts of the text and put together to make meaning; *author and you* questions, which are based on information provided in the text but the student is required to relate it to their own experience; *on my own* questions which do not require the student to have read the passage but he/she must use their background or prior knowledge to answer the question.

QAR is a simple strategy to teach students as long as direct instruction is used. First, explicitly teach to students that there are four types of questions they will encounter. Define each type of question and give specific examples. Second, read a short passage aloud to your students. Then use questions you have prepared to ask after you stop reading. When you have finished reading, read the questions aloud to students and model how you decide which type of question you have been asked to answer. Next, model for your students how you find information to answer your question (i.e., in the text, from your own experiences, etc.). After you have modeled your thinking process for each type of question, invite students to read another passage on their own, using a partner to determine the type of question and how to find the answer. Once students have practiced this process for several types of questions and over several lessons, you may invite students to read passages and try to create different types of questions for the reading. It is important to highlight characters emotions, thoughts, beliefs and motivations in these tasks as these traits often move the plot forward and it is the struggles students with ASD have with Theory of Mind that can impact their reading comprehension.

Social Stories

Understanding the emotions, thoughts, beliefs and motivation of characters is key to comprehending a text and can be difficult for students with ASD. Social stories can be used to help students consider the perspectives of characters in social situations. They can also be used to help students understand language that may be contrary to the character's actions. Teachers can develop social stories around the text that is being used

or they may be used to identify how a students typical classmates use strategies to help them comprehend. Carol Gray has published a number of books such as: *Comic strip conversations* (1994), that teachers may find useful to help with this strategy.

Inferring

An inference is a "guess" that a reader makes or an opinion that the reader forms based on the information that the reader has. It can be referred to as making a logical guess or reading between the lines. When reading a text, making an inference means a reader uses clues from a story to figure out something that the author didn't tell them; a reader needs to fill in the blanks left by the author. For students with ASD, it is important to work on making inferences about the emotions, thoughts, and motivations of characters to help them understand the text they are reading. Students with ASD may struggle with understanding the idea that people have thoughts other than their own, understanding situations from others' perspective, and predicting behavior based upon context that could cause them to struggle with comprehending text. By being able to make inferences about others emotions, thoughts, and motivations students with ASD will be better able to comprehend the stories they read.

Teacher should introduce this strategy by modeling it for students, starting with every day examples, moving to listening activities, and then to text examples. A teacher could use pictures from a magazine or book and ask their students what is happening in the picture or what the story might be about. The teacher should model thinking aloud as he/she makes connections between the facts and his/her prior knowledge.

The teacher should model making inferences while reading. When the teacher reads, he/she should explain his/her inferences as they go. For example, the text says that Peter's brother yelled at him and Peter was crying. I inferred that Peter is sad and hurt that his brother hit him.

Teachers can also write out inferences on the board or chart paper. Many learners are visual learners so writing it out to go along with hearing the inferences may benefit many students with ASD. As well, teachers may use graphic organizers to help students' structure their thoughts and provide some visual cues on the process of developing

inferences. A great resource is Adrienne Gear's (2015) *Reading power, revised and expanded edition: Teaching students to think while they read.*

Connections

In order for students to understand what they are reading, it is very helpful for them to learn how to make connections between the text and their own knowledge and experiences, particularly when trying to comprehend a character's emotions, beliefs, thoughts and motivations. Making connections while reading helps the reader monitor his/her own thinking, keeps him/her actively engaged while reading, and leads to an overall better understanding of the text. There are three types of connections that students need to learn about:

1) Text to Self: The reader connects what he/she has read to something in his/her own life.

2) Text to Text: The reader connects what he/she has read to something he/she has read previously.

3) Text to World: The reader connects what he/she has read to something he knows about the world.

When teaching readers about text to self-connections, the teacher needs to teach students to ask themselves questions such as:

- What from my own life does this remind me of?
- Which characters in this story can I relate to and why?
- How did I feel when I read this?

The teacher should scaffold this direct instruction by reading a story to the students and using the above questions the teacher should model how to answer the questions. Model that these questions can be asked at any point in the text such as after a sentence, a paragraph, a page, a chapter, or the whole book. Then encourage the student to answer the questions. It may take many examples and a lot of practice for a student to answer these questions on his/her own. A good resource for teaching connections is Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read.*

Weak Central Coherence Strategies

Students with weak central coherence do not see the "big picture" when reading but rather just focus on details. These students might over focus on minor irrelevant details while missing the main idea or purpose of the text. These students may also understand the rote facts in a text but may not be able to pull them together to understand the big picture. There a number of strategies that can be tried or implemented to help students with weak central coherence understand the overall meaning of a text.

Question Generation Strategy

Question generation is a reading comprehension strategy that requires readers to ask and answer meaningful questions about a text's main ideas. This strategy requires readers to actively engage and interact with the text. If students with ASD do not see the "big picture" when reading, the question generation strategy can be used to respond to questions about the theme or overall meaning of the text rather than detail oriented questions.

To begin teaching this direct instruction strategy, the teacher should explain to students that they will be learning to generate their own questions about a text to help their understanding of the text. Then the teacher will teach how to generate questions. The teacher will model the generation of questions while reading a story to the students. Over time the teacher will have students practice asking questions with feedback being provided, working towards students being able to ask questions independently.

The teacher will need to teach about types of questions and how to identify important information in the text. As students learn to independently ask questions, the teacher will need to help students learn to monitor their own questions. Two good resources to use when teaching students to learn to generate questions are: Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read* and *Question Generation* (2014) by Sharon M. Look.

Inferring

Inferring is a process in which a readers figures out something that the author doesn't actually say. Readers can use clues that are in the text and things from their own mind to make inferences. Sometimes it's called reading between the lines and it can add a lot more meaning to the story. Making inferences can help a reader to see the big picture or the overall gist of a story.

Teacher should introduce this strategy by modeling it for students, starting with every day examples, moving to listening activities, and then to text examples. A teacher could use pictures from a magazine or book and ask their students what is happening in the picture or what the story might be about. The teacher should model thinking aloud as he/she makes connections between the facts and his/her prior knowledge.

The teacher should model making inferences while reading. When the teacher reads, he/she should explain his/her inferences as they go. For example, the text says that Peter's brother yelled at him and Peter was crying. I inferred that Peter is sad and hurt that his brother hit him.

Teachers can also write out inferences on the board or chart paper. Many learners with ASD are visual learners so writing it out to go along with hearing the inferences may benefit many students with ASD. As well, teachers may **use graphic organizers** to help students' structure their thoughts and provide some visual cues on the process of developing inferences. A good resource for teaching inferring is Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read.*

Activating Prior Knowledge

Activating prior knowledge is when students make connections between the text they are reading and either other texts, the real world, or their personal experiences. Making connections allows readers with ASD to use their personal knowledge to put together the pieces of the story to understand the author's bigger picture. The three types of connections that students should access for prior knowledge:

> 1) Text to Self: The reader connects what he/she has
>
> read to something in his/her own life.

2) Text to Text: The reader connects what he/she has

read to something he/she has read previously.

3) Text to World: The reader connects what he/she has

read to something he knows about the world.

When teaching readers about text to self-connections, the teacher needs to teach students to ask themselves questions such as:

- What from my own life does this remind me of?
- Which characters in this story can I relate to and why?
- How did I feel when I read this?

The teacher should scaffold this direct instruction by reading a story to the students and using the above questions the teacher should model how to answer the questions. Model that these questions can be asked at any point in the text such as after a sentence, a paragraph, a page, a chapter, or the whole book. Then encourage the student to answer the questions. It may take many examples and a lot of practice for a student to answer these questions on his/her own. A good resource for teaching making connections is Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read.*

Retelling

A story retell includes everything about the story, characters, setting, problem, solution and the main events in order. Students restate the information in their own words.

Ensure that students understand the purpose behind completing a story retell. A teacher could use phrases such as, "Retelling is a great way to share information about a text with others," or "Retelling is a good way to remember what you've read and to check your understanding."

Story braids, or "Braidy" (Moreau & Fidrych, 2008) can be made and used to help students retell stories. These provide a visual as well as a tactile option to help students remember the story elements and what they need to focus on in the story to be able to complete the retell.

Teachers should begin by ensuring that students understand beginning/middle/end and model how to find that in a book. Then the teacher can model adding details between the begging and middle and then the middle and end to ensure the important parts of the story are included in the retell.

There are many graphic organizers available that allow teachers to walk students through retelling a story. Direct instruction should be used, with the teacher teaching the story elements (characters, setting, problem, solution, main events) and modeling how to complete the assigned organizer. Gradually students help complete the organizer and then are given the opportunity to complete them independently.

Summarizing

Summarizing a story is a process in which a student reiterates the main ideas or events of a story. Students restate the information in their own words. There are a variety of ways that a teacher can teach students how to summarize a story.

Somebody Wanted But So Then

"Somebody Wanted But So Then" is a summarizing strategy for stories. Each word represents a key question related to the story's essential elements:

- **Somebody**: Who is the story about?
- **Wanted**: What does the main charter want?
- **But**: Identify a problem that the main character encountered.
- **So**: How does the main character solve the problem?
- **Then**: Tell how the story ends.

This device should be taught using direct instruction. This can be completed orally and in writing using graphic organizers.

5 W's, 1 H

The 5 W's, 1 H strategy relies on six questions: who, what, when, where, why, and how. These questions allow the reader to identify the main character, the important details, and the main idea.

o **Who** is the story about?

o **What** did they do?

o **When** did the action take place?

o **Where** did the story happen?

o **Why** did the main character do what he/she did?

o **How** did the main character do what he/she did?

This strategy should be taught with the direct instruction approach. It can be completed orally and in writing using graphic organizers.

First Then Finally

The "First Then Finally" technique helps students summarize events in chronological order. The three words represent the beginning, main action, and conclusion of a story.

o **First**: What happened first? Include the main character and main event/action.

o **Then**: What key details took place during the event/action?

o **Finally**: What were the results of the event/action?

This strategy should be taught with the direct instruction approach. It can be completed orally and in writing using graphic organizers.

Give Me the Gist

When someone asks for "the gist" of a story, they want to know what the story is about. In other words, they want a summary, not a retelling of every detail. To introduce the gist method, a teacher can explain that summarizing is just like giving a friend the gist of a story. Then have your students tell each other about their favorite books or movies in 15 seconds or less. This strategy should be taught with the direct instruction approach. It can be completed orally and in writing using graphic organizers. Students on the spectrum may need to have this strategy modeled numerous times along with support to practice it.

Executive Dysfunction Strategies

Students with ASD often struggle with areas of executive functioning when it comes to reading comprehension. These students need help with determining the purpose behind reading, monitoring their understanding, making connections, accessing prior knowledge, creating schema, and inferring. There are a variety of strategies that teachers can implement to help students be more successful in this area.

Anaphoric Cueing

Cognitive flexibility is the area of executive functioning that refers to a person's ability to be flexible with their thoughts and actions, think about something in multiple ways, and to switch gears during activities. In order to comprehend when reading a individual must be able to identify whom specific pronouns refer. Pronouns are the most common form of anaphora, a word that replaces or refers to a word used earlier in the text. The ability to produce and comprehend pronouns can be a barrier to comprehending text. Anaphoric cueing are strategies that assist readers to correctly understand pronoun referents. There are two strategies that appear to be effective for students with ASD, cloze design and the use of a specific graphic organizer.

Before using either strategy, the teacher should explain to students that there are short ways of saying things and provide examples. Hints can be given that the character a pronoun refers to is most likely found in the same or previous sentence. The teacher can use direct instruction where the teacher initially highlights the pronoun referents, and then allows the student to help, eventually leading to the student attempting to identify the pronoun referent independently.

Cloze Strategies

Cloze strategies require the reader to fill in blanks or choose from a selection of names to identify the character that each pronoun refers to. Teachers should start with cloze examples that have three possible referents: one that is inappropriate, one that is syntactically correct but not relevant to the story, and one that makes sense. Example: "Nancy enjoys reading when she (Paula, Nancy, book) has a quiet place to sit." Teachers should scaffold this activity, making the

complexity of the choices more difficult as the student demonstrates the ability to complete the tasks. Teachers should also select texts that allow them to provide specific practice. Students should be asked to identify the pronoun and then can be asked to identify whom the pronoun refers to. These specific questions can be faded over time as the student demonstrated an increased skill in this area.

Graphic Organizer

A graphic organizer can also be used to help students with ASD to identify all pronouns referring to a particular character. It has been found that adding a graphic organizer to anaphoric cueing was found to be effective when used with texts that students were interested in (Williamson et al., 2015). Prior to reading the text, students are given the organizer to complete, identifying possible referents that would refer to the identified character (i.e. Nancy - her, she, you). The students are then asked to generate a question about the text that uses a pronoun (i.e. Where does she like to read?). Again, scaffolding should be provided to ensure that students are able to generate a question and then should be positively reinforced for completing the task. In text, characters emotions and thoughts are often shown so it is important for students to be able to identify referents in text.

Inferring

An inference is a "guess" that a reader makes or an opinion that the reader forms based on the information that the reader has. It can be referred to as making a logical guess or reading between the lines. When reading a text, making an inference means a reader uses clues from a story to figure out something that the author didn't tell them; a reader needs to fill in the blanks left by the author. As students with ASD struggle with getting the bigger picture or gist of the story, making inferences can help them fill in some of those blanks. For students with difficulties with working memory, it can be difficult for them to access the information they have read that would allow them to make inferences. For students with ASD, it is important to work on making inferences around the emotions, thoughts, and motivations of characters to help them understand the text

they are reading. Making inferences can further be made more difficult if a student needs to access social information but has difficulties with understand emotions or controlling their own emotions.

Teacher should introduce this strategy by modeling it for students, starting with every day examples, moving to listening activities, and then to text examples. A teacher could use pictures from a magazine or book and ask their students what is happening in the picture or what the story might be about. The teacher should model thinking aloud as he/she makes connections between the facts and his/her prior knowledge.

The teacher should model making inferences while reading. When the teacher reads, he/she should explain his/her inferences as they go. For example, the text says that Peter's brother yelled at him and Peter was crying. I inferred that Peter is sad and hurt that his brother yelled at him.

Teachers can also write out inferences on the board or chart paper. Many learners are visual learners so writing it out to go along with hearing the inferences may benefit many students with ASD. As well, teachers may use graphic organizers to help students' structure their thoughts and provide some visual cues on the process of developing inferences. A good resource for teaching inferring is Adrienne Gear's (2015), *Reading power, revised and expanded edition: Teaching students to think while they read.*

Connections/Prior Knowledge (KWL)

Executive function describes a set of mental processes that helps us connect past experience with present action. We use executive function when we perform such activities as planning, organizing, strategizing and paying attention to and remembering details. When students make connections while reading, they are accessing any prior knowledge they have to help them understand the text, which would be difficult for a student with ASD who has deficits with executive functioning. If a child struggles to hold and link ideas together in their mind, making connections would be difficult. To be able to make connections, students need to learn and understand that there are three types of connections:

1) Text to Self: The reader connects what he/she has
read to something in his/her own life.

2) Text to Text: The reader connects what he/she has

read to something he/she has read previously.

3) Text to World: The reader connects what he/she has

read to something he knows about the world.

When teaching readers about text to self-connections, the teacher needs to teach students to ask themselves questions such as:

o   What from my own life does this remind me of?

o   Which characters in this story can I relate to and why?

o   How did I feel when I read this?

The teacher should scaffold this direct instruction by reading a story to the students and using the above questions the teacher should model how to answer the questions. Model that these questions can be asked at any point in the text such as after a sentence, a paragraph, a page, a chapter, or the whole book. Then encourage the student to answer the questions. It may take many examples and a lot of practice for a student to answer these questions on his/her own. A good resource for teaching making connections is Adrienne Gear's *Reading power, revised and expanded: Teaching students to think while they read* (2015).

Question Generation Strategy

Question generation is a reading comprehension strategy that requires readers to ask and answer meaningful questions about a text's main ideas. This strategy requires readers to actively engage and interact with the text. If a student struggles with considering multiple bits of information or ideas at one time and cannot actively switch between them when engaged in a task, generating questions could be difficult for that student.

To begin teaching this direct instruction strategy, the teacher needs to explain to students that they will be learning to generate their own questions about a text to help their understanding of the text. Then the teacher will teach how to generate questions. The teacher will model the generation of questions while reading a story to the students. Over time the teacher will have students practice asking questions with feedback being provided, working towards students being able to ask questions independently.

The teacher will need to teach about types of questions and how to identify important information in the text. As students learn to independently ask questions, the teacher will need to help students learn to monitor their own questions. Two good resources to use when teaching students to learn to generate questions are: Adrienne Gear's *Reading power, revised and expanded: Teaching students to think while they read* (2015)" and *Question Generation (2014)* by Sharon M. Look.

Retell

In order for a student to accurately retell a story, they need to be able to access the executive functioning skills of organization and working memory. If a student struggles with organization, creating an organization structure to gather and manage information from text and integrate information from text to their existing knowledge could prove to be difficult. As well, if a student struggles to hold and link ideas in their mind, trying to retell a story accurately could be difficult. As a story retell includes everything about the story, characters, setting, problem, solution and the main events in order, a student needs to be able to organize the information in an efficient way and to be able to integrate all the information to be able to present it in an accurate manner.

When teaching this strategy, teachers need to ensure that students understand the purpose behind completing a story retell. A teacher could use phrases such as, "Retelling is a great way to share information about a text with others," or "Retelling is a good way to remember what you've read and to check your understanding."

Story braids, or "Braidy" (Moreau & Fydrych, 2008) can be made and used to help students retell stories. These provide a visual as well as a tactile option to help students remember the story elements and what they need to focus on in the story to be able to complete the retell.

Teachers should begin by ensuring that students understand beginning/middle/end at model how to find that in a book. Then the teacher can model adding details between the begging and middle and then the middle and end to ensure the important parts of the story are included in the retell.

There are many graphic organizers available that allow teachers to walk students through retelling a story. Direct instruction should be used, with the teacher teaching the

story elements (characters, setting, problem, solution, main events) and modeling how to complete the assigned organizer. Gradually students help complete the organizer and then are given the opportunity to complete them independently.

Think Aloud

When using a think aloud strategy, teachers verbalize aloud while reading a selection orally. In these verbalizations the teacher describing things they're doing as they read to monitor their comprehension. The purpose of the think-aloud strategy is to model for students how skilled readers construct meaning from a text. Teachers should model this strategy to start and then scaffold to allow students to have the opportunity to try the strategy for themselves. The teacher can gradually allow students to practice this strategy with peers under supervision until it is apparent that the student is capable of completing the task independently. The purpose of a think allowed is to model self-monitoring skills to students who struggle with this area of executive functioning. These students need to be explicitly taught to reflect on their learning and to recognize when and how to use strategies to help improve their reading comprehension.

Visuals - self monitor checklist

Students who struggle with executive dysfunction need support with learning to self-monitor their reading. One way in which teachers can provide this support is with the use of visuals. As students learn strategies to help them self-monitor their reading, a visual cue or reminder may be useful to help them to continue to use the taught strategy. Many programs, such as *Reading 44: A Core Reading Framework* (North Vancouver School District 44, n.d.) have premade bookmarks that provide visuals that help students visually remember taught strategies.

Visualizing

Visualizing is when readers use all their senses to form images or pictures of the story as they read. The use of visualizing can help students to develop their working memory as it engages and enhances multiple facets of working memory. The teacher should model their visualizing as they read to the students, providing scaffolding to allow

students to participate and share their visualizations. The next step sees the teacher reading to the students and stopping at pre-selected spots in the book and recording what they are visualizing. After the story is finished, the teacher then reads the story showing the pictures and discussing with the students any similarities and differences their sketches may have with the pictures in the book. The teacher should gradually release this task to students, allowing them to orally discuss their visualizations with others or to record them on paper. The students should select a text at a just right reading level for them and use the text, stopping periodically, to sketch the images they have visualized while reading. A good resource for teaching visualizing Adrienne Gear's *Reading Power, Revised and Expanded Edition: Teaching students to think while they read* (2015).

Language Strategies

Many students with ASD struggle with language impairments with language impairments. These students demonstrate difficulties with vocabulary and oral language comprehension that leads to difficulties with language understanding. Your school's Speech and Language Pathologist would be a great resource when trying to help a student with language. There are a number of strategies that can be employed to help students develop their ability to understand language in written text.

Anaphoric Cueing

Students with language impairments have difficulty assigning proper pronouns to characters in written text. They may not understand that the character Alice is later referred to as her or she. Pronouns are the most common form of anaphora, a word that replaces or refers to a word used earlier in the text. The ability to produce and comprehend pronouns can be a barrier to comprehending text. Anaphoric cueing are strategies that assist readers to correctly understand pronoun referents. There are two strategies that appear to be effective for students with ASD, cloze design and the use of a specific graphic organizer.

Before using either strategy, the teacher should explain to students that there are short ways of saying things and provide examples. Hints can be given that the character a pronoun refers to is most likely found in the same or previous sentence. The teacher can use direct instruction where the teacher initially highlights the pronoun referents, and then allows the student to help, eventually leading to the student attempting to identify the pronoun referent independently.

Cloze Strategies

Cloze strategies require the reader to fill in blanks or choose from a selection of names to identify the character that each pronoun refers to. Teachers should start with cloze examples that have three possible referents: one that is inappropriate, one that is syntactically correct but not relevant to the story, and one that makes sense. Example: "Nancy enjoys reading when she (Paula, Nancy, book) has a quiet place to sit." Teachers should scaffold this activity, making the

complexity of the choices more difficult as the student demonstrates the ability to complete the tasks. Teachers should also select texts that allow them to provide specific practice. Students should be asked to identify the pronoun and then can be asked to identify whom the pronoun refers to. These specific questions can be faded over time as the student demonstrated an increased skill in this area.

Graphic Organizer

A graphic organizer can also be used to help students with ASD to identify all pronouns referring to a particular character. It has been found that adding a graphic organizer to anaphoric cueing was found to be effective when used with texts that students were interested in (Williamson et al., 2015). Prior to reading the text, students are given the organizer to complete, identifying possible referents that would refer to the identified character (i.e. Nancy - her, she, you). The students are then asked to generate a question about the text that uses a pronoun (i.e. Where does she like to read?). Again, scaffolding should be provided to ensure that students are able to generate a question and then should be positively reinforced for completing the task. In text, characters emotions and thoughts are often shown so it is important for students to be able to identify referents in text.

Question Generation Strategy

Question generation is a reading comprehension strategy that requires readers to ask and answer meaningful questions about a text's main ideas. This strategy requires readers to actively engage and interact with the text. For children with ASD, including the question generation strategy in reading instruction has the potential to increase reading comprehension skills. In studies that include question generation, students have increased language use and improved their reading comprehension (Palincsar & Brown, 1984). Following the teaching of the question generation strategy, children with reading comprehension difficulties have increased performance on reading comprehension measures (Palincsar & Brown, 1984).

To begin teaching this direct instruction strategy, the teacher should explain to students that they will be learning to generate their own questions about a text to help

their understanding of the text. Then the teacher will teach how to generate questions. The teacher will model the generation of questions while reading a story to the students. Over time the teacher will have students practice asking questions with feedback being provided, working towards students being able to ask questions independently.

The teacher will need to teach about types of questions and how to identify important information in the text. As students learn to independently ask questions, the teacher will need to help students learn to monitor their own questions. Two good resources to use when teaching students to learn to generate questions are: *Reading Power, Revised and Expanded Edition: Teaching students to think while they read* (2015) by Adrienne Gear and *Question Generation* (2014) by Sharon M. Look.

Vocabulary

In order to help students with ASD develop their vocabulary and to help them with reading comprehension, teachers can pre-teach vocabulary that they will encounter in a new text that may be tricky for them. During guided reading sessions, the teacher may review preselected words and phrases that they believe students may have a difficult time with. At the same time, the teacher can allow students to identify any words that they believe to be unknown or tricky. Students may then be provided a variety of opportunities to practice these words or phrases. Students may be asked to: answer questions that require them to use their knowledge of the word's definition (i.e. What is something you collect?), complete a sentence stem (i.e. I like to collect....), ask questions that involve pairs of instructed words (If you gave your collected pins to your brother, would he appreciate it?), or ask students to choose which of two scenarios better fits a word and have them defend their choice.

Oral Language Opportunities

To help students with ASD develop their language skills, teachers may provide them multiple opportunities to practice their oral language. Students may be asked to retell the text they have read, using specific taught vocabulary (characters, setting, problem, solution) or to use a Braidy (Moreau & Fydrych, 2008) to retell the story.

Closed Captions

In Emily Iland's book *Drawing a Blank: Improving Comprehension for Readers on the Autism Spectrum* (2011), she outlines the strategy of using closed captions to help students with hyperlexia. Teachers may watch a television show or movie with students with closed captioning on. Draw the students' attention to the closed captions, explaining they match the dialogue in the show and are there to help those who are hearing impaired or who may have a difficult time understanding the conversations going on. Explain to students that the closed captions may help draw their attention to how the words are structured into sentences and that it may help them see and hear the individual words. As the show is viewed, the teacher should pause the show at different points to reinforce the meaning or relevance of specific captions that are important to the overall understanding of the show. As well, question the students about the story, ensuring that the captions are helping them to understand the story line.

Film and Visualizing

Another strategy outlined in Iland's book is that of film and visualization. Teachers may chose to show a movie version of a story or book prior to students reading the text. The teacher should ensure that the movies are short and closely match the text that will be read. The story elements (characters, setting, plot) can be analyzed prior to the book being read. This may help students who struggle to demonstrate knowledge about texts they are reading.

Word Elements

Teachers may choose to do whole class or small group lessons on prefixes and suffixes to help students understand vocabulary nuances. Explicitly define and teach the concept of a prefix focusing on 3 features: a prefix is a group of letters that go in front of a word; a prefix changes the meaning of a word; when you take a prefix away a word is left. Give examples. In next lesson, focus on the negative meanings of un- and dis- which mean "not". One example is obey (disobey). Introduce two to four more prefixes that mean "not": in-, im-, ir- and non- (this may need to be done over the course of multiple lessons). Show how these prefixes change the meaning of a known word. Introduce two

different meanings of a prefix re- (back and again). Revisit other meanings of un- and dis- (do the opposite) as well as in- and im- (in or into). Introduce the following useful prefixes: en-, em-, over-, and mis-. Use this same approach for teaching suffixes after prefixes are mastered. Practice by breaking down words selected by linking to the student's area of interest and have the student give examples for the meaning of each word.

Pragmatics

Pragmatics are the ability to understand language and communication in social contexts and to use this understanding to predict character intentions and behaviors.

Reciprocal Teaching

Teachers can use summarizing, questioning, clarifying, and predicting using "wh" questions (perspective taking) questions in matching exercises, flashcards, and fill in the blank. This is an interactive student activity.

- o Provide a checklist including icons with key words or illustrating   key words or phrases to monitor their own reading and interactions with peers.
- o Student and peers ask each other who, what, when, where, why, how questions using cards to keep their conversations on track and focused while reading and after they read. Use some or all of the cards, as appropriate for the student and story. Start with one to two cards that are most easily inferred, e.g. who, where, and increase complexity with what, how, and why.

Knowing When You Know and When You Don't Know

This is one in which students learn to monitor their comprehension to clarify confusion and answer questions about related to characters and other information in the read text. Coding technique can help students monitor their comprehension and to stay on track with their thinking. The use of sticky notes can be modified to meet the need and interest of the student. For example, use markers that relate to the student's interests. If the student likes dinosaurs, put dinosaur stickers on sticky notes or use dinosaur shaped sticky notes to make this task more interesting for the student and help with engagement.

- o Use sticky notes coded a "?", or any term selected by or taught to the student to indicate any confusion they may have with the text. Students can be instructed to think about how the word they are confused about is used in the assigned passage, looking at clues in the assigned passage.
- o Use sticky notes with a light bulb or any term selected but the student to indicate a connection or understanding.

Conclusion

Research shows there are identifiable reasons for students with ASD to struggle with reading comprehension; therefore there should be a handbook that addresses each of these reasons and the strategies that may be beneficial for teachers and educators to use for each of these areas of deficit. El Zein, Solis, Vaughn, and McCulley (2014) found that modified instructional interventions were associated with improved comprehension for students with reading difficulties and may improve reading comprehension in students with ASD.

Reading comprehension requires readers to build a mental picture of the text (Nation & Norbury, 2005) and what is described in the text (Kintsch & Rawson, 2005). Readers must combine previous knowledge with information in the text to create a visual scene (Kintsch & Rawson, 2005; Perfetti et al., 2005). Readers must make connections between words in the text and their prior knowledge about the world to comprehend. Building these visual scenes involves many different processes, such as making connections between background knowledge and text.

The reasons a child with ASD may fail to comprehend are likely to be complex. It is important to understand which aspects of reading comprehension a certain child finds difficult in order to implement appropriate and well-targeted interventions for that child (Nation & Norbury, 2005). Students with ASD can read but do not have full control over the processes necessary for making meaning (Nation & Norbury, 2005). Educators must understand that reading accuracy is not a guarantee of adequate reading comprehension. Students with hyperlexia demonstrate that it is possible to decode and read fluently but not understand what has been read.

The research available on students with ASD and reading comprehension support the need for a handbook of reading comprehension strategies that may be useful for working students with ASD. Brown, Oram-Cardy and Johnson (2013) discuss that with the increase in the number of students being diagnosed with ASD, and therefore the number of these students in mainstream classrooms, more and more teachers may find themselves ill-equipped to meet the complex needs of these learners. Randi et al. (2010) suggests that given the wide range of strengths and weaknesses exhibited by students

with ASD, there is no single reading comprehension intervention that may be appropriate for all students with ASD. They discuss that despite there being a number of studies on interventions for teaching students with ASD there are surprisingly few interventions specifically for reading comprehension that have been described in the literature. Most literature examines instructional approaches rather than interventions that are targeted at specific reading comprehension difficulties, the focus being on practicing skills rather than teaching skills to help scaffold the cognitive processes involved in deriving meaning from reading (Randi et al., 2010). Randi et al. (2010) go on to state that they believe it is reasonable to assume that parents and educators will be looking to researchers to provide a wide range of interventions to target the individual needs of readers with ASD.

Whalon and Hart (2011b) stated that students with ASD might have later difficulties with reading comprehension due to a lack of targeted comprehension instruction earlier in their school careers. They believe that educators should emphasize explicit language and reading comprehension instruction in the beginning grades. Whalon and Hart (2011b) go on to state that by participating in direct and explicit comprehension strategy instruction, learners with ASD may learn a strategy that may help them to be able to access the general education curriculum in reading and may also give them the tools to engage in meaningful academic discussions with their peers.

In another paper, Whalon and Hart (2011a) argued that many of the struggles with reading comprehension encountered by students with ASD may be due to the instructional focus in their classrooms. In some classrooms, there is a lack of focus on targeted reading comprehension strategy instruction, most reading instruction focuses on teacher-directed questioning that places the student in a passive role of responder as opposed to an active constructor of meaning. Whalon and Hart (2011a) went on to explain that it is imperative that readers with ASD are taught reading comprehension strategies that explicitly address how to interact with text. They acknowledge that for these strategies to be effective, there is a need for collaboration between general and Special Education teachers.

Koegel, Matos-Fredeen, Lang, and Koegel (2011) argued that the general education classroom is the least restrictive environment for students with ASD to learn. They questioned to what extent classroom teachers are prepared to implement behavior,

communication and social interventions to help students with ASD. I believe you can pose this same question to ask to what extend are these teachers prepared to implement reading comprehension interventions to help students with ASD. With the increase in the number of students with ASD in general education classrooms, classroom teachers are feeling growing pressure to ensure that all leaners comprehend text across all content areas (Carnahan & Williamson, 2016). Koegel et al. (2011) found that many teachers choose interventions based on their ability to easily implement them in the classroom, their own personal beliefs, the interventions perceived appropriateness for a certain student and the availability of materials and support staff that may be needed. These attempts at intervention may not be successful as they are teacher centered rather than being selected because they address a specific deficit or need that a student may have.

　　　　A handbook that outlines a variety of strategies for reading comprehension is useful for classroom teachers to not only help their students with ASD but any other struggling readers in their classroom. While reading comprehension instruction has begun to receive growing attention, readers with ASD continue to experience poor academic progress (Carnahan & Williamson, 2016). Accarso, Finnegan, Gulkus, and Papay (2017) stated that their research supports the need for ongoing support for teachers of learners with ASD and ongoing professional development in the area of effective practices for teaching reading comprehension to students with ASD. If teachers are unaware of the more than a few specific strategies to implement, this handbook may give them a wider variety of strategies to choose from, particularly if what they are currently trying is not working for a student. This handbook could also be used in the form of professional development to help instruct classroom teachers on the use of proposed practice for teaching reading comprehension.

　　　　In this handbook, I have outlined and explained the five main reasons students with ASD struggle with reading comprehension: hyperlexia, theory of mind, weak central coherence, executive dysfunction, and language impairments. I have gone on to provide a variety of strategies that could be used by classroom and special education teachers to help support students with ASD with developing stronger reading comprehension skills.

　　　　There continues to be the need for more research on ASD and reading. Students reading comprehension skills fall along a spectrum, much like the disorder itself, showing

that they are unique individuals with unique needs. While one strategy may work for one student, it may not work for another. This demonstrates the need for an exhaustive list of strategies to try. Given the small amount of research determining the effectiveness of such comprehension strategies, it will be important for teachers to monitor their student's success with the implemented strategies, in order to ensure high quality instruction and consistency with the principles of response to intervention.

<u>Recommended Resources</u>

Reading Assessment Resources

- PM Benchmarks
- Dynamic Assessment of Reading Test (DART)
- Developmental Reading Assessment (DRA)
- Fountas and Pinnell Benchmark Assessment System

Graphic Organizer Resources

- Scholastic
  - see website for a variety of books containing graphic organizers, www.scholastic.com/teachers/
  - also see website for lesson on graphic organizers, www.scholastic.com/teachers/lesson-plans/teaching-content/graphic-organizers-reading-comprehension/
- Websites- the following websites provide a variety of free graphic organizers
  - www.teachervision.com/lesson-planning/graphic-organizer
  - www.teacherprintables.net/free-printable-organizers.html
  - www.dailyteachingtools.com/free-graphic-organizers.html
  - www.edrawsoft.com/reading-comprehension-graphic-organizers.php

Strategy Resources

- Reading Power, Revised & expanded Edition: Teaching Students to Think While They Read by Adrienne Gear
- The Reading Strategies Book by Jennifer Serravallo
- The Guided Reading Teacher's Companion: Prompts, Discussion Starters & Teaching Points by Jan Richardson
- The Next Step Forward in Guided Reading: An Assess-Decide-Guide Framework for Supporting Every Reader by Jan Richardson

The Basic Reading Comprehension Kit for Hyperlexia and Autism by Pam
Britton Reese and Nena C. Challenner

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Appendix

Name: _____   Date: _____

Graphic Organizer for Summarizing

SOMEONE:
Who is the main character?

WANTED:
What did the main character want?

BUT:
What was the problem?

SO:
How did the character try
to solve the problem?

THEN:
What was the resolution to the
problem?

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Name:_____

SUMMARY

Title:	Characters:

Beginning

Middle

End

© Educating Everyone 4 Life

Name: _____

Ask and Answer Questions Before, During, and After Reading.

Question	Answer
Before Reading	
During Reading	
After Reading	

Teacher's Take-Out

Compare and Contrast Chart Graphic Organizer

| Item #1_____ | Item #2_____ |

How are they alike?

_____
_____
_____
_____
_____

How are they different?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

read write think

Name _____   Date _____

8 Events

Directions: Draw pictures to represent 8 main events. Make sure they are in chronological order.

CHARACTER MAP #1

Name:_____ Date:_____

Feelings	Description

Character

Behavior	Personality Traits
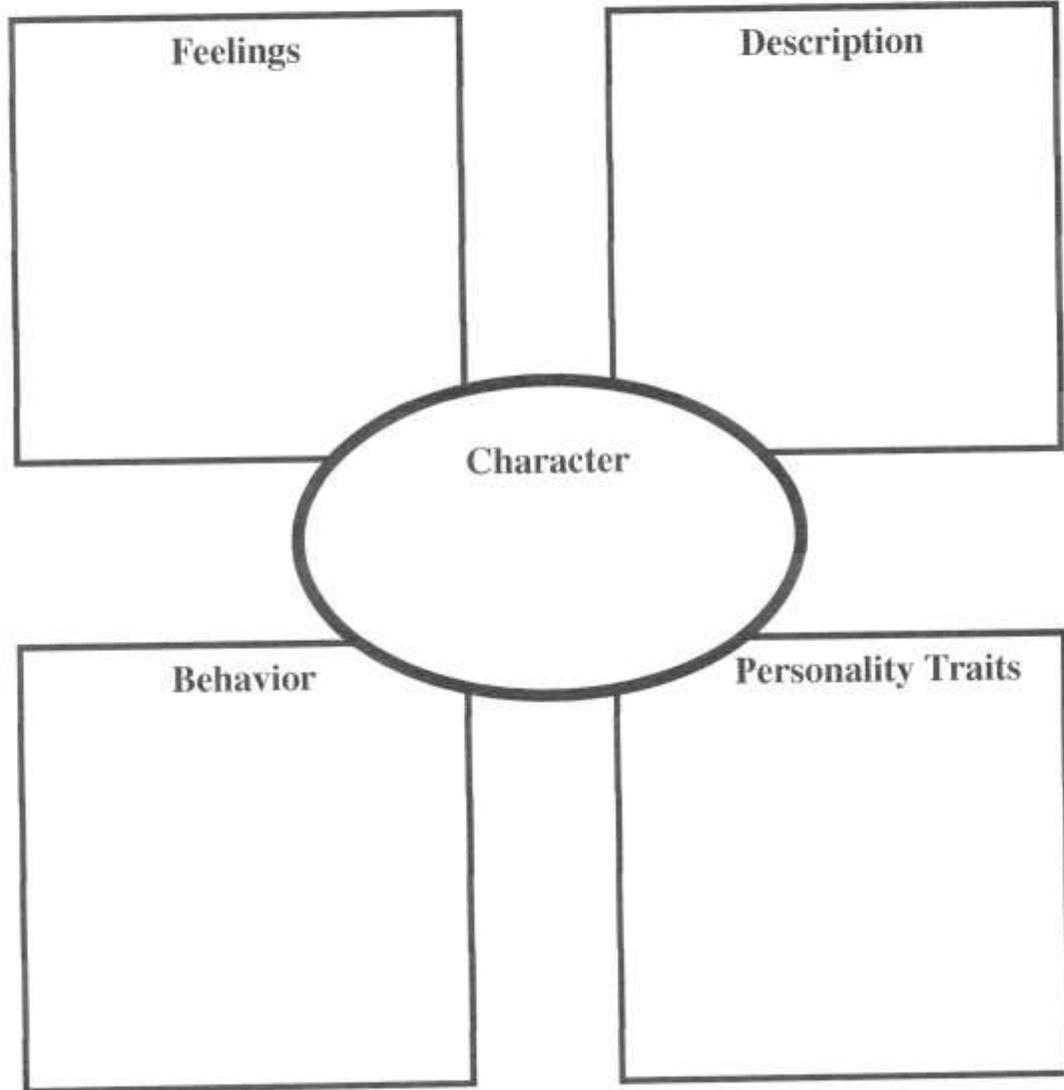
GO.5.1

Chapter 5: Conclusion, Implications, Recommendations, and Lessons Learned

In my 22 years of teaching, I have had numerous jobs that have provided me with a variety of experiences with different students, parents, and colleagues. My experiences have all been within the same community but I have taught at numerous schools within my community as well as at some of the smaller rural schools that are part of our vast school district. I have been a Teacher Teaching on Call (TTOC), held temporary contracts and eventually had my own classrooms. For many years I taught at a different school each year and until I moved into learning support, I can honestly say that I have never taught the same grade two years in a row! In this time, I taught every elementary grade, from 1 to 7, except kindergarten. I have taught different subjects; I have even been a computer, music and PE prep teacher. I was able to train in Reading Recovery and that became a valuable skill that helped me successfully post into more jobs and to this day this training is the basis for most of what I do in learning support. At one time I even worked in Speech and Language (thankfully under a very experienced SLP) when my school found itself without a SLP. I feel that all of these experiences led me to Learning Support and gave me a substantial background to draw on when working with students and supporting teachers.

Implications

This section will outline the two broad implications of my research study. I will begin with pedagogical implications as what my work means in the teaching profession is a very important focus of my project. Then I will outline the methodological implications of my project for others who may be considering completing a project of a similar nature.

Assessment

Results

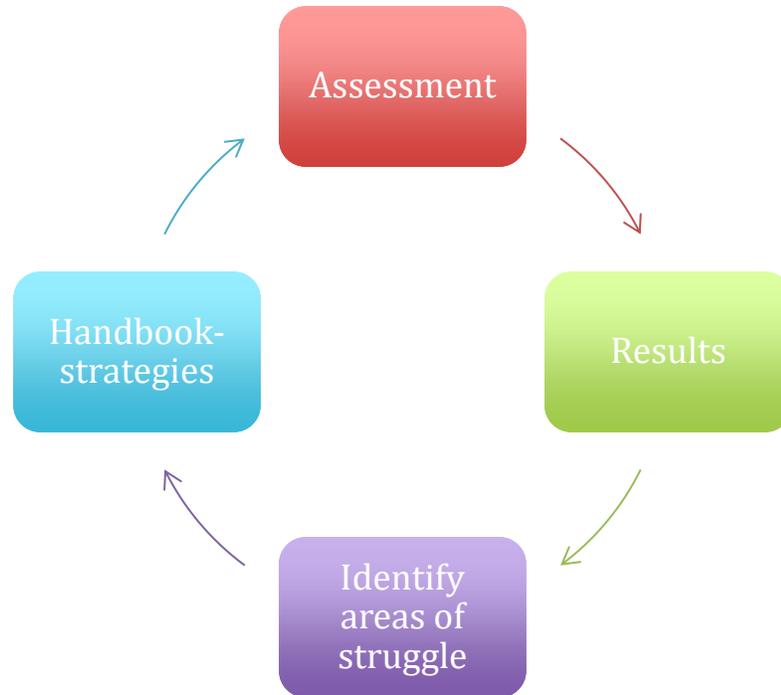Identify areas of struggle

Handbook-strategies

Figure 4: Steps for using *Thinking Beyond the Words: Strengthening Reading Comprehension for Students with ASD*

Pedagogical. My research-based handbook, *Thinking beyond the words: Strengthening reading comprehension for students with ASD*, will be shared with colleagues. It will be print and coil-bound and shared with interested colleagues. As the number of students with ASD we encounter in our classrooms increases, there is a growing need for strategies to help these students develop reading comprehension skills and strategies. It is hoped that colleagues will find this handbook useful and beneficial to use with their students. One colleague, in particular, who has been following this journey with me, has asked if next fall we could spend a Professional Development day together going over the handbook and seeing how she could use her reading assessments to identify the areas of struggles that her students have and then devise a plan to try some of the suggested strategies outlined in the handbook in her guided reading sessions. It is hoped that she will see the cyclical nature of the handbook. Assessments need to be

completed, the results compiled and then analyzed. Then strategies should be selected

from the handbook in relation to the areas where the student is struggling. Then to

determine if the strategies are working, the cycle starts again with assessment (see Figure

4). This could be a Professional Development workshop that is offered to any interested

colleagues.

An important finding of my project is that it is impossible to ignore the fact that

most students with ASD show deficits in reading comprehension. It is important for

educators to understand the component skills and processes involved in reading for

understanding. Understanding these skills and processes has important implications for

teachers and how they design instruction to strengthen reading comprehension skills in

children with *ASD*.

The research examined in the literature review suggests that there is not one single

strategy or method of teaching reading comprehension that will be effective for every

child with ASD.   ASD is very complex and each student diagnosed with ASD has unique

learning needs and styles. While teachers may feel prepared to use effective practices,

they may not necessarily be using them. Professional development opportunities may be

needed to help teachers to implement these practices in their classrooms. Professional

development opportunities that increase teacher preparedness to effectively implement

appropriate instructional practices may improve the effectiveness of teachers which may

result in increased time spent using the practice that are helping increase student

outcomes.

The need to differentiate instruction for reading comprehension for students on

the autism spectrum appears to be necessary and essential. Students with ASD are a

heterogeneous group where considerable variation exists among students. It is

recommended that professional development help teachers to differentiate between

students and where their deficits with reading comprehension lie. Once teachers are able

to pinpoint areas of difficulties for a specific student, they can select appropriate

strategies that target the aspect of comprehension where the student struggles. If a

teacher were to determine that a student was struggling with using or understanding

pronouns, they can access and use strategies to help the student with anaphoric cueing. It

is the role of professional development to help teachers to learn how to access and use a

bank of effective practices and how to differentiate these practices based on the needs and

challenges of individual students with ASD.

      Methodological. The use of qualitative content analysis provided a number of

benefits to my research. As it is an unobtrusive approach, it did not require me to find

and/or rely on live subjects/volunteers. I did not have to spend time finding an

appropriate sample group and did not need to structure my work around when the sample

group being used would be available.

      Another benefit to using QCA was that I was able to gather needed information

without being directly involved in the research gathering process. This allowed the

analysis of my data to be objective, valid, and any possible bias was reduced while I was

able to eliciting meaning from the data collected and drawing realistic conclusions

(Bengtsson, 2016).

      QCA did not require me to intrude into the research context. This unobtrusive

method reduced possible biases that might have resulted from the intrusion of the

researcher or the measurement instrument being used. When obtrusive measures are

used, they are direct and participant observation requires that the researcher be physically

present. These types of measures can lead respondents to alter their behavior or thoughts

in order to look good in the eyes of the researcher.

Another benefit of QCA research is that it was relatively low-cost compared to

other methods. There was no need to provide any participants with a stipend or to

provide some sort of benefit for their participation. Rather, the low costs that were

incurred were for paper and ink to print hard copies of many of the research articles that

were used.

A fourth benefit of QCA is that as unobtrusive research is less prone to mistakes.

Correcting mistakes made in data collection is much easier that trying to fix errors made

when using other methods. Going back to the source of the data to gather more

information or correct some problem in the original data collection only required me to

review the literature I was using, not having to ask participants to redo a questionnaire, a

survey or an interview.

I was able to use the QCA method to examine ASD and reading comprehension

difficulties extensively and to identify the specific areas of difficulties that different

individuals with ASD experience. From there, QCA allowed me to examine and compile

a list of strategies that have been trialed or suggested (based on research) to be used with

individuals with ASD to help them acquire stronger reading comprehension skills, and

which are what the handbook I produced is comprised of.

QCA also has a number of challenges. People may consider the results of QCA

as not valid as they could be considered to be the subjective opinion of the researcher.

Replicating the research may not be straightforward. While the documents used are

permanent, individual researchers may determine different codes or levels of codes when using the same research. It is possible that individual researchers' biases may play a role in what information they deem to be important and noteworthy.

A further challenge of QCA is that is a very time-consuming form of research. The researcher is required to review the materials multiple times to continue to find new levels of coding. When a researcher is using a large number of research articles this can become very laborious, tedious, and time consuming.

Qualitative content analysis draws parallels between objects rather than counting differences within data samples. If a researcher is interested in looking at patterns or themes or in compiling information from previous research that touches on the same topic but does not look at all facets of the topic, QCA could be a good option for a researcher. QCA systematically transforms a large amount of text into a highly organized and concise summary of key results.

Recommendations

This section will outline recommendations for the use of the handbook. Recommendations will be that outline for teachers how and when the strategies in the handbook could be learned and then implemented. I will also outline the lessons I learned while on my journey to complete this project.

Piloting the handbook. To extend this project further, the next step could be to have 10 colleagues read and review the handbook and give feedback on the usefulness of the handbook. These suggestions could be used to make adjustments to the handbook that teachers may find valuable. Once this review is done and adjustments made, these 10 colleagues could be asked to use the handbook as part of their reading instruction for a

six-month period. They would then be asked to complete a questionnaire to assist in further evaluating the usefulness of the handbook. It could be suggested to teachers that the strategies contained in this handbook, while identified as strategies that could be useful when working with students with ASD, could be best practices that could be used to benefit a number of students when helping them develop reading comprehension skills.

Book club. The handbook could be used by a group of teachers for a book club. Teachers could meet monthly to discuss aspects of assessing the reading comprehension levels of their students with ASD, what strategies to try and then to report back and discuss/evaluate how well the strategies worked. Further recommendations could be discussed and taken back to the classroom for the teacher to attempt to implement.

Professional Learning Community. A group of teachers within a school could choose to use the handbook as a resource for a yearlong Professional Learning Community focus. This could allow teachers who what to ensure that their students with ASD are getting their reading needs met to be part of a group with the same focus. Like a book club, these teachers could take pieces from their group discussions and implement them in their classroom. Further discussion could then occur around what worked, what did not work and where to go next.

Guided Reading. Classroom teachers could use the strategies in the handbook with students other than just those with ASD. Teachers could assess their students reading comprehension and determine where their difficulties lie. From there, the teacher could form homogenous reading groups that would be formed based on areas of difficulties. The teacher could then use the appropriate recommended strategies for the focus of their guided reading sessions, to hopefully, benefit all of their struggling readers.

Lessons Learned

It was in the past 15 years as a Learning Support Teacher that I have had the pleasure of meeting and working with numerous students with ASD. I have also helped many parents navigate the system to procure assessments for their children. It has been in this time that I realized that there is a "Now what?" that needs to be answered and addressed at the school level once these assessments are completed.

While working with these students with ASD, often on communication and social skills, it has become apparent to me that these areas also have an impact on their ability to comprehend text. One of my students, who I worked with from kindergarten to grade 6, refused to read any beginning chapter books with people in them. He was happy to read anything with animals in it but no people. When questioning him about this, he told me he "gets" animals but people are too confusing. It was a year long journey that we travelled together, slowly getting him to embrace stories with people with a great deal of scaffolding and conversations around what their emotions and reactions were and why. It was at this time that I would say that I began using many of the strategies outlined in the handbook, not really realizing at the time that I should have kept them documented in a central location, as they would come in handy for this project!

While working with this one student in particular, I began having conversations with some of my colleagues, discussing what was and wasn't working for my student and brainstorming other ideas to try. It was during this time that I began offering the strategies that had been tried and the suggested strategies to colleagues to try with students in their classrooms who were not making the reading progress the teachers had hoped for. People on my staff started to approach me as a resource to help them find

ways to move their students along their literary journeys. Working in a dual track school

with both English and French Immersion, I was fascinated to see that teachers from both

languages were seeking assistance for their students. This solidified my thinking that

reading, and the way we approach teaching it, really is universal and that we teach the

same strategies and skills despite the language of instruction.

Conclusion

It is hard to get my head wrapped around the idea that this is the end of my

master's journey. In many ways it feels like just yesterday that I was immersed in my

first class, "Educating Exceptional Students." Although this project has had many bumps

and life has definitely thrown a few delays into the mix, I am incredibly proud to be at

this point. I began this process with a project in mind and knew I wanted it to relate to

either reading or autism and am thrilled that I was able to find a way to join the two

together to complete what I hope to be a very useful project. The work I do on a daily

basis has been changed and shaped by the knowledge I have gained from the courses I

have taken and the people I have met and had the opportunity to learn from. I hope that

my professional life continues to change in a positive way, for my students and me,

through the use of my handbook.

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