

The Effects of Graphic Novels on the Reading Comprehension Scores of Students with Autism  
Spectrum Disorders (ASD)

A Research Project Report

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by

Kristina Hill

The Effects of Graphic Novels on the Reading Comprehension Scores of Students with Autism  
Spectrum Disorders (ASD)

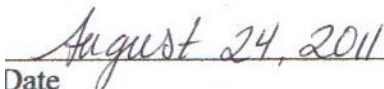
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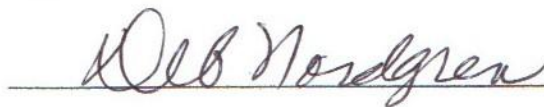
  
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This thesis is dedicated to my father for his deep wisdom and never-ending love and support; to my mother, for passing on her love of education, and never hiding her unending pride and enthusiasm for her daughter; to my sister, for being there to encourage me through the hard times; and to my son, Christian, for supporting and loving his mom every step of the way.

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## Abstract

Students with Autism Spectrum Disorder (ASD) face several challenges in the academic setting. These students often struggle to comprehend what they have read, which makes learning difficult. Lack of reading comprehension also causes difficulties to becoming a productive member of society. Without careful preparation and planned interventions, students with ASD will continue to struggle in this essential area. Due to the increased prevalence of ASD in our society, it is imperative that educators utilize interventions that meet the needs of these students and offer the support they require.

The purpose of this study was to explore whether the use of selected graphic novels would increase the reading comprehension scores of two students on the Autism Spectrum. The study evaluated the reading comprehension scores of two students with ASD during and after reading selected non-graphic novels. The results were considered. The study then evaluated the reading comprehension scores of these students with ASD during and after reading selected graphic novels. These two sets of scores were then compared.

The results of this study did not support the hypothesis that graphic novels increase the reading comprehension scores of students with ASD. Student scores did not reflect an increased comprehension level. However, the two students involved in this study reported that they enjoyed reading graphic novels and would like to read more graphic novels.

## Chapter 1: Introduction

Autism Spectrum Disorders (ASD) are becoming increasingly prevalent throughout the United States. It is estimated that one in 160 children have an ASD (Wilkinson, 2010). It is believed that this trend will continue to rise, often even referred to as the “Autism Epidemic.” Individuals with ASD face several challenges including social relationships, sensory deficits, and academic difficulties. With the current increase of the identification of ASD, it is essential that professional educators find successful interventions to insure that these individuals receive the support they require.

### *Problem*

Students with an ASD face several challenges in the academic setting. Due to their delays in social interactions, sensory demands, and academic requirements throughout the day, students with ASD are often left struggling. These students often have particular difficulty in reading. According to Flores and Ganz (2009), students with ASD frequently have difficulties comprehending what they have read. In fact, they note that some students with ASD have great discrepancies between their decoding ability and comprehension ability. Since comprehension is essential to understanding, this has a major impact on the education of students with ASD. It is also required for being a productive member of society. Without careful planning and appropriate interventions, students with ASD will continue to struggle in this essential area. In addition, there are still unanswered questions about ASD. Therefore, there is an apparent lack of research indicating the way ASD affects individual people.



### *Purpose Statement*

The purpose of this study will be to explore whether the use of selected graphic novels will increase the reading comprehension scores of two students on the Autism Spectrum.

### *Rationale for Study*

Since student reading comprehension has a direct impact on how students learn in other academic subjects taught in the public schools, it is important to explore strategies and interventions to help struggling students with ASD live independent lives. Being able to comprehend what was read is important for living in today's society.

### *Hypothesis*

It is hypothesized those students with ASD involved in this study will have higher reading comprehension scores after reading selected graphic novels than after reading selected non-graphic novels.

### *Summary of Study*

The focus of this study will be on the effectiveness of using graphic novels to increase reading comprehension of selected students on the Autism Spectrum. The study will look at reading comprehension scores these students receive when evaluated during and after reading selected non-graphic novels. These scores will be considered. The study will then look at the reading comprehension scores these students receive when evaluated during and after reading selected graphic novels. These two sets of scores will then be compared.

### *Limitations of Study*

There are a number of limitations in this study. One of the limitations is the size of the study. The sample chosen for this study is one of convenience. Since the students chosen are already attending the ASD program at Bay View Elementary, they will be included in the study because of convenience. There will only be two students with ASD participating in the study, making it more of a case study. Because of this, there will only be data collected from two students. Due to the small size there will also not be a control group. Another limitation will be the number of instruments used for the study. Two non-graphic novels will be presented and read by the students and two graphic novels will be presented and read by the students. A final limitation is the environment used to conduct the study. The study will take place in a resource classroom with several adults and students entering and exiting. In addition, it is noted that because this is a case study and a pilot study the results are not expected to generalize but to raise questions and directions for future reading comprehension instruction.

### *Delimitations*

This study does not study the effects of graphic novels on the reading comprehension of students with other developmental disabilities, other than ASD. This study does not evaluate the fluency, decoding ability, or pronunciation ability of the students involved in the study. Finally, this study will not evaluate the effectiveness of the teacher or the instruments.

### *Referenced Definition of Terms*

Graphic novel- A novel that is told through a combination of text and art; it is often portrayed in a comic book format.

Reading Comprehension- The act of understanding and interpreting information within at text.

Autism Spectrum Disorder- A range of neurological disorders that are characterized by impairments in communication and social relationships and obsessions and repetitive behaviors.(American Psychiatric Association, 1994, pp. 69-84).

## Chapter 2: Review of Literature

Students with an Autism Spectrum Disorder (ASD) face several challenges in the academic setting. Because of the social requirements, sensory demands, and various subjects taught throughout the day, students with ASD are often left struggling. These students have particular difficulty in reading. According to Flores and Ganz (2009), students with ASD often have difficulties comprehending what they have read. They note that some students with ASD have great discrepancies between their decoding ability and comprehension ability. Since comprehension is essential to understanding, this has a major impact on the education of students with ASD. Reading comprehension is also required for being a productive member of society. Without careful planning and appropriate interventions, students with ASD will continue to struggle in this essential area. The following sections explore the characteristics of ASD and the common reading comprehension struggles these students face. Finally, the benefits of graphic novels are explored.

### *What is ASD?*

According to the American Psychiatric Association (1994), Autism Spectrum Disorders (also known as Pervasive Developmental Disorders) are developmental disorders characterized by qualitative impairments in social interaction, qualitative impairments in communication and restricted, repetitive and stereotyped patterns of behavior, interests, and activities, and delays or abnormal functioning in at least one of the following areas, with onset prior to the age three: social interaction, language used in social communication, symbolic or imaginative play. There are five disorders that constitute ASDs. They include, Autistic Disorder, Asperger Disorder, Rett's Disorder, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder Not

Otherwise Specified (PDD-NOS). The most common of these disorders are Autistic Disorder, Asperger Disorder, and PDD-NOS (American Psychiatric Association, 1994, pp. 69-84).

Authors Hallahan and Kauffman (2003) point out that although people diagnosed with ASD have common characteristics; challenges vary greatly from person to person. They add that ASD affects all nationalities and socioeconomic statuses equally, with the occurrence being higher in males than in females. In fact, males are diagnosed with the disorder four to five times as often as females.

ASD is steadily increasing across the world. According to Wilkinson (2010), studies indicate that there is a worldwide increase in the occurrence of ASD. These rates have been steadily increasing over the past decade. In fact, one in every 160 school age children is currently identified with an ASD. With the rise of ASD, there are also higher rates of children receiving special education. Wilkinson includes information that the number of students with ASD who are receiving special education services has risen dramatically. In fact, Wilkinson adds that it is reported through the Individuals with Disabilities Education Improvement Act, Part B, the criteria for autism across the United States has increased more than 500% from 1995-2005.

The exact cause of ASD is unknown. It is believed that a combination of different factors may contribute to the onset of ASD. Wilkinson, (2010) explains that there is not a clear explanation to why the rates of ASD have risen. However, there are multiple theories to explain the increase including changes in diagnostic criteria, improved identification, higher availability of resources, and increased understanding of ASD among professionals. Leonard et al., (2010) includes that there is evidence that genetic origins, being higher in males, may have a factor in

the cause of ASD. Also, pre- and perinatal complications and environmental factors may play a role in the cause of ASD.

In summary, this section touched on the work of authors Flores and Ganz (2009), the *American Psychiatric Association (1994)*, Wilkinson (2010), Leonard et al. (2010) and Hallahan and Kaufmann (2003) as it relates to an understanding of ASD. Although ASD can be a devastating diagnosis, often including difficulties in social skills, sensory needs and difficulties comprehending read material, there are several strategies and resources available for people who suffer from this disorder, as is explored in the next section. The next section also explores the relationship between ASD and reading comprehension.

### *ASD and Reading Comprehension*

Reading comprehension is a complex process that involves many interrelated components (Randi, Newman, & Grigorenko, 2010). There are several cognitive processes that affect an individual's comprehension. In order to comprehend, readers pull from many cognitive processes including attention, making inferences, vocabulary, and prior knowledge.

Through recent studies, it has been suggested that some students with ASD struggle with reading comprehension. Due to the complex nature of the disability, there are several theories that attempt to explain the reason why these students show a significant need in this area. Although not all of these theories correlate to one another, it is agreed that there are most likely multiple causes of reading comprehension difficulties. Currently, research is being conducted to better understand the strengths and weaknesses of the academic performance among students with ASD. According to authors Randi et al. (2010), people with autism tend to have high word recognition abilities, with poor reading comprehension skills, also known as hyperlexia.

Newman et al. (2006) explain the hyperlexia phenomena further. Newman et al. explain that hyperlexia is characterized by a very high word decoding ability which is significantly higher than a student's general intelligence or degree of comprehension. In addition, Vacca (2007), includes that children with autism show difficulties answering questions that require them to make inferences about a story; they are more likely to correctly answer factual questions. Further, Smith Myles et al. (2002) report scores from a study where it was found that students with Asperger disorder also struggled with reading comprehension, especially when reading non-factual texts. The authors also include that the students with Asperger disorder incorrectly answered two thirds of the inferential questions asked. Finally, Huemer and Mann (2010) report scores from a study where 41 students with ASD were assessed in four components of reading skills including word recognition, text-reading accuracy, non-word decoding, and reading comprehension. It was found that 65% of the participants performed at least one standard deviation below the population norms in reading comprehension.

There are several theories that suggest why students with ASD tend to struggle with reading comprehension. Gately (2008) states that children with ASD tend to struggle with comprehending narrative texts. This is believed to be due to lack of theory of mind that students with ASD tend to display. Theory of mind is the understanding that others have mental states and ideas. It is also the ability to reflect on others' actions. Gately reports that lack of theory of mind is one of the core deficits of ASD. These individuals have difficulty understanding how others feel and struggle in understanding differing thoughts and opinions. They also tend to have difficulty understanding jokes, metaphors, and opinions. The author states that the lack of theory of mind may have an impact on the ASD individual's ability to comprehend reading, recognize and understand emotions, use pragmatic language skills, and understand character goals in a

story. Another theory to suggest why students with ASD struggle with reading comprehension states that students with ASD pay very close attention to details and lose the larger story picture.

Randi et al. (2010) states that individuals with ASD tend to focus on details or words rather than the overall meaning of the text. Since individuals on the ASD spectrum tend to have high word-decoding skills, they are able to pay particular focus on the components of a text. Randi et al. adds that individuals with ASD also struggle with organizational strategies, especially in complex texts which require the reader to create an organizational structure to maintain memory. Randi et al. also explain that individuals with ASD struggle to make inferences from a text. Although they can make generalizations with guidance, they have difficulty making inferences at the abstract level. Finally, Randi et al. add that students with ASD struggle with reading comprehension due to a lack of understanding of the pragmatics of language, including emotions, intentions, and social contexts. They further explain that word recognition skills and reading comprehension skills develop independently. Therefore, students may be strong in one area and lack in the other. The authors note that over 65% of students identified with ASD who have measureable reading skills, have difficulties with reading comprehension perhaps due to a tendency to focus on individual words rather than overall meaning. Therefore, these students tend to have strong word recognition skills with low comprehension. Further, the authors report findings from a recent study. Through the study, it was found that students with autism relied much more on visual skills imagery to aid in comprehension than students without autism.

Huemer and Mann (2009) also look at reading skills and based on their work state that students with ASD struggle with reading comprehension due to their difficulties integrating information into context, deficits in communicative skills, and difficulties integrating



information into the situation. These authors state that students with ASD also tend to struggle comprehending written text because they have difficulty effectively accessing background knowledge.

In summary, this section reviewed the work of authors Randi et al. (2010), Newman et al. (2006), Smith Myles et al. (2002), Huemer and Mann (2010), Vacca (2007), and Gately (2008) specifically concerning reading comprehension and reading difficulties. This section highlighted the various theories given to explain why ASD students may struggle with their reading comprehension. The next section will examine graphic novels.

### *Graphic Novels*

Graphic Novels are becoming an integral piece of child and adolescent literature. Once thought of as glorified comics, graphic novels are earning credibility among students, parents, and teachers. Filled with colorful, vibrant illustrations, graphic novels can attract and capture any student's interest (Samet, 2010).

The research on graphic novels has been limited as has the literature reviewed on graphic novels. Because of this, no studies of the effects of graphic novels on the reading comprehension of students with ASD were found. Therefore, this section reviews what was found on graphic novels related to teaching reading skills with students. .

A graphic novel is a novel that is told through a combination of text and art. It is often portrayed in a comic book format. Unlike a comic book, graphic novels have a beginning, middle, and end, and are usually presented in a bound format. Schwarz (2002) reports that graphic novels appeal to a variety of readers. They also offer several genres, help students develop critical thinking skills, and encourage students to read. The author adds that graphic

novels integrate visuals with the written word, similar to current screen media. Schwarz also notes that graphic novels are usually able to hold the reader's attention due to their unique visual layout.

Graphic novels are growing in popularity and can often be found among the shelves of school and public libraries. It is reported by Samet (2010) that graphic novels are not only increasing in popularity, but they are available for all ages, budgets, and interests. School personnel are starting to understand their immense value for engaging students and offering differentiated instruction. Samet also says that these books also help to convey the elements of fiction including plot, mood, and setting. The author also concludes that graphic novels engross struggling readers, assist in comprehension, and help build vocabulary.

There are several types of graphic novels. In Bucher and Manning's article (2004), several types of graphic novels are reported, including superhero tales, fantasy, science fiction, historical adventure stories, humor, fiction, historical fiction, and magna (Japanese tales). The authors share that graphic novels also include autobiographies, nonfiction texts, and biographies.

Although graphic novels are visually similar to comic books, differences exist. Gallo and Weiner (2004) state that graphic novels differ from comic books in the way they are presented. Usually graphic novels are offered on higher quality paper and have brighter, more intense colors than comic books. The authors also include that graphic novels often range from 44 pages to 224 pages.

Graphic novels are also beneficial in improving literacy development. Downey (2009) reports that graphic novels often appeal to reluctant readers, engage visual learners, and improve reading comprehension. Downey reports that they can also assist in promoting creative thinking

and demonstrating social skills. It is noted that Vacca (2007) includes in his article that children with autism often learn visually and benefit from bright, colorful pictures.

Throughout this section, the works of Schwarz (2006), Samet (2010), Bucher and Manning (2004), Gallo and Weiner (2004), Vacca (2007), and Downey (2009) were reviewed. In summary, graphic novels are becoming increasingly popular among children and adolescents. There are several styles and types available, and they are being used to assist students in literacy growth. The research on graphic novels has been limited. Also, the literature reviewed on graphic novels in this section has been limited. Because of this, no studies of the effects of graphic novels on the reading comprehension of students with ASD were found for this Review.

In this Review of the Literature the definition and characteristics of ASD were explored; reading comprehension difficulties among students with ASD were examined; and graphic novels were investigated. The next chapter utilizes this background information to explore the effects graphic novels will make on the reading comprehension scores with two students on the Autism Spectrum.

### Chapter 3: Research Methodology

Students with an Autism Spectrum Disorder face several challenges in the academic setting. Due to their delays in social interactions, sensory demands, and various academic demands throughout the day, students with ASD are often left struggling. These students commonly have particular difficulty in reading. According to Flores and Ganz (2009), students with ASD often have difficulties comprehending what they have read. In fact, they note that some students with ASD have great discrepancies between their decoding ability and comprehension ability. Since comprehension is essential to understanding, this has a major impact on the education of students with ASD. This skill is also required for being a productive member of society. Without careful planning and appropriate interventions, students with ASD will continue to struggle in this essential area. The purpose of this study was to explore whether the use of selected graphic novels would increase the reading comprehension scores of two students on the Autism Spectrum. Since student reading comprehension has a direct impact on how students learn in other academic subjects taught in the public schools, it is important to explore strategies and interventions to help students with ASD who are struggling to live independent lives.

It is hypothesized the students with ASD involved in this project will have higher reading comprehension scores after reading selected graphic novels than after reading selected non-graphic novels.

#### *Participants*

The participants in this case study are two students who attend the ASD room at BayView Elementary, in Proctor, MN. One of the students is a male who is in 5<sup>th</sup> grade during the study; the other student is a female who is in 4<sup>th</sup> grade during the study. One of the students has a

medical diagnosis of Asperger Syndrome. The other student has a diagnosis of high functioning autism. One of the students has been attending Bay View Elementary for the last five years, four months; the other student has been attending Bay View for four months. Each student included in this study is currently reading at different levels. One participant is reading at a 2.5 reading level; the other participant is reading at a 3.5 level.

Both students come from middle socioeconomic households. Although these students have several common characteristics, including an ASD medical and education diagnosis, they are also very unique from one another, due mainly to the fact that ASD is a spectrum disorder. Both students were chosen for this study due to their current placement in the ASD program. Since both students already attend the ASD program, this would not have a major impact on their current scheduling. Further, students and their scores were to be kept confidential. Students in this study are only known as Student A and Student B. Since ASD is often a misunderstood disorder, and there is still many unanswered questions about it, a case study is an appropriate way to study how this reading tool might impact students with this poorly understood disorder.

### *Instrumentation*

The students' reading comprehension was assessed throughout the reading of two selected non-graphic novels. The scores were then considered. Then the students' reading comprehension was also assessed throughout the reading of two selected graphic novels. These two sets of scores were then compared. Each reading comprehension assessment was created by the researcher and given to the students during preselected times. Each assessment was given to each student individually. The researcher created both reading comprehension assessments. (See Appendices A & B.) Each assessment consists of five general short answer comprehension

questions. The first assessment (See Appendix A) was given after the first, second, and third quarter of each assigned novel. The next assessment (See Appendix B) was given after each novel was completed. The researcher determined if an answer was correct or incorrect, and scored it appropriately. The researcher then determined each student's scores by computing his or her points earned compared to the total number of points per assessment. A written script, created by the researcher, was used when presenting each assessment to each student (See Appendix C.). In order to increase the tool's validity, both assessments and the script were reviewed by another special education teacher at Bay View Elementary. The study also took a qualitative approach. The students were asked about their interest in the two formats – graphic and non-graphic. As stated, ASD is still an often misunderstood disorder. Through a mixed quantitative and qualitative study, information may be collected to help assess what is important and what needs to be further studied.

### *Procedures*

In order to assess the effectiveness of graphic novels on the reading comprehension scores of select students with ASD, specific procedures were followed. To begin, permission to conduct this study was presented to the principal at Bay View Elementary. The proposal was also reviewed by the UW Superior IRB and given permission to proceed. Permission forms were then presented to the participants' parents. The study did not begin until after permission was received. The study took place in the ASD classroom at Bay View Elementary, between the hours of 8:15 a.m. and 2:30 p.m. There were other adults and students in the classroom, however, each select student with ASD worked directly with the researcher. Each select student with ASD was introduced to a new non-graphic novel. The students read the first quarter of the graphic novel. They were then assessed using the attached reading comprehension assessment

(See Appendix A.). The students then read the second and third quarters of the non-graphic novel. After each quarter of the book, the students' reading comprehension was assessed using the attached reading comprehension assessments (See Appendix A.). The students were then assessed after reading the entire novel (See Appendix B.). A written script, created by the researcher, was used when presenting each assessment to each student (See Appendix C.). The students were then introduced to a new graphic novel. The graphic novel was of similar reading level to the non-graphic novel previously read. The students were again assessed after reading the first three quarters of the graphic novel using the attached reading comprehension assessments (See Appendix A.). The students were also assessed after reading the entire novel (See Appendix B.). A written script, created by the researcher, was used when presenting each assessment to each student (See Appendix C.). The students then read another non-graphic novel and another graphic novel. Both of these books were read and instructed through the same process as the first two books. By the end of the study implementation, the select ASD students had each read four novels; two non-graphic novels and two graphic novels. Each student completed sixteen reading comprehension assessments. The students' reading comprehension scores of the non-graphic novels were compared to their reading comprehension scores of the graphic novels. After all assessments had been completed, each student completed a survey about his or her experience reading graphic and non-graphic novels (See Appendix D.).

#### Chapter 4: Results of Study

The implementation of this study occurred in the Autism Spectrum Disorders classroom at BayView Elementary, between the hours of 8:15 a.m. and 2:30 p.m. During the time of data collection, other adults and students were present. However, the researcher worked directly with each select student involved in this study. To begin, the researcher introduced a teacher chosen non-graphic novel to the select students. The students read the first quarter of the non-graphic novel. They were then assessed the same day using the created reading comprehension assessment (See Appendix A.). The students then read the second and third quarters of the non-graphic novel. After reading the second and third quarters of the book, the students completed a reading comprehension assessment using the attached reading comprehension assessments the same day of reading (See Appendix A.). The students were then assessed after reading the last quarter of the book immediately after reading (See Appendix B.). When presenting each assessment to each student, the researcher read a created script (See Appendix C.). After completing the first non-graphic novel, students were introduced to a new teacher chosen graphic novel. The graphic novel was of a similar reading level to the non-graphic novel previously read. The students were again assessed after reading the first three quarters of the graphic novel the same day of the readings, using the attached reading comprehension assessment (See Appendix A.). They were also immediately assessed after reading the entire novel (See Appendix B.). The same written script, created by the researcher, was again used when presenting each assessment to each student (See Appendix C.). The students then read another teacher chosen non-graphic novel, and another teacher chosen graphic novel. Both of these books were read and instructed through the same process as the first two books. By the end of the study implementation, the select ASD students each read four novels; two non-graphic novels



and two graphic novels. Each student also completed sixteen reading comprehension assessments. The average amount of time it took the students to read a novel was four days. It is noted that when students were absent or when scheduled academic times were changed, the students needed more than four days to read the current novel. The students' reading comprehension scores of the non-graphic novels were compared to their reading comprehension scores of the graphic novels. After all assessments were completed, each student completed a survey about his or her experience reading non-graphic and graphic novels.

### *Findings*

The following Tables illustrate the students' scores on the reading comprehension assessments after reading the non-graphic novels and the graphic novels. The first graph illustrates Student A's scores on the comprehension tests after reading the first three quarters of each of the four novels. The first novel, a non-graphic novel, (1a, 1b, 1c, 1d) was *Esio Trot*, by Roald Dahl. All four assessments of this novel had seven total possible points. The second novel, a graphic novel, (2a, 2b, 2c, 2d) was *The Adventures of Daniel Boom aka Loud Boy*, by D.J. Steinberg. All four assessments of this novel had seven possible points. The third novel, a non-graphic novel (3a, 3b, 3c, 3d) was *Golden Finger*, by Roald Dahl. All four assessments of this novel had eight possible points. The fourth novel, a graphic novel, (4a, 4b, 4c, 4d) was *The Boxcar Children*, by Gertrude Chandler Warner. All four assessments of this novel had eight possible points. The results are as follows:

Table 1: Student A scores on comprehension tests after reading first three quarters of novels.

Non-graphic Novels							Graphic Novels						
Novel 1			Novel 3				Novel 2			Novel 4			
	1a	1b	1c	3a	3b	3c		2a	2b	2c	4a	4b	4c
<b>Q1</b>	3 pt	1.5 pt	1.5 pt	3 pt	2 pt	3 pt	<b>Q1</b>	1pt	1pt	1pt	1pt	4pt	4pt
<b>Q2</b>	1 pt	1 pt	1 pt	0 pt	1 pt	1 pt	<b>Q2</b>	1pt	1pt	0pt	0pt	1pt	1pt
<b>Q3</b>	1 pt	0 pt	0 pt	0pt	0 pt	0 pt	<b>Q3</b>	0pt	0pt	0pt	0pt	0pt	0pt
<b>Q4</b>	1 pt	1 pt	1 pt	1pt	1 pt	1 pt	<b>Q4</b>	1pt	1pt	0pt	0pt	0pt	0pt
<b>Q5</b>	1 pt	1 pt	0 pt	1pt	0 pt	0 pt	<b>Q5</b>	1pt	0pt	1pt	0pt	0pt	0pt
<b>total</b>	7 pt	4.5 pt	3.5 pt	5pt	4 pt	5 pt	<b>total</b>	4pt	3pt	2pt	1pt	5pt	5pt

Table 2: Student A scores on comprehension tests after completing each novel.

Non-graphic Novels			Graphic Novels		
	1d	3d		2d	4d
<b>Q1</b>	1 pt	4 pt	<b>Q1</b>	1pt	4pt
<b>Q2</b>	1 pt	1 pt	<b>Q2</b>	0pt	1pt
<b>Q3</b>	0 pt	0 pt	<b>Q3</b>	0pt	0pt
<b>Q4</b>	0 pt	0 pt	<b>Q4</b>	0pt	1pt
<b>Q5</b>	0 pt	1 pt	<b>Q5</b>	0pt	0pt
<b>total</b>	2 pt	6 pt	<b>total</b>	1pt	6pt

The next Tables illustrate Student B's scores on the assessment tests. The student read the same novels and completed the same assessments as Student A.

Table 3: Student B scores on comprehension tests after reading first three quarters of novels.

	Novel 1			Novel 3			Novel 2			Novel 4			
	Non-graphic Novels						Graphic Novels						
	1a	1b	3c	3a	3b	3c	2a	2b	2c	4a	4b	4c	
<b>Q1</b>	3 pt	1.5 pt	1.5 pt	3 pt	2 pt	3 pt	<b>Q1</b>	1pt	1pt	1pt	1pt	4pt	4pt
<b>Q2</b>	1 pt	1 pt	1 pt	0 pt	1 pt	1 pt	<b>Q2</b>	1pt	1pt	0pt	0pt	1pt	1pt
<b>Q3</b>	1 pt	0 pt	0 pt	0pt	0 pt	0 pt	<b>Q3</b>	0pt	0pt	0pt	0pt	0pt	0pt
<b>Q4</b>	1 pt	1 pt	1 pt	1pt	1 pt	1 pt	<b>Q4</b>	1pt	1pt	0pt	0pt	0pt	0pt
<b>Q5</b>	1 pt	1 pt	0 pt	1pt	0 pt	0 pt	<b>Q5</b>	1pt	0pt	1pt	0pt	0pt	0pt
<b>total</b>	7 pt	4.5 pt	3.5 pt	5pt	4pt	5 pt	<b>total</b>	4pt	3pt	2pt	1pt	5pt	5pt

Table 4: Student B scores on comprehension tests after completing each novel.

	Non-graphic Novels		Graphic Novels		
	1d	3d	2d	4d	
<b>Q1</b>	1 pt	4 pt	<b>Q1</b>	1pt	4pt
<b>Q2</b>	1 pt	1 pt	<b>Q2</b>	0pt	1pt
<b>Q3</b>	0 pt	0 pt	<b>Q3</b>	0pt	0pt
<b>Q4</b>	0 pt	0 pt	<b>Q4</b>	0pt	1pt
<b>Q5</b>	0 pt	1 pt	<b>Q5</b>	0pt	0pt
<b>total</b>	2 pt	6 pt	<b>total</b>	1pt	6pt

The comprehension assessments consisted of five questions. The first question stated on the comprehension assessments administered after the first three quarters of the novels stated:

Who are the main characters in the story so far?

The first question stated on the comprehension assessments administered after the completing each novel stated:

Who are the main characters in the story?

By the end of the implementation of the study, each student answered sixteen Question #1's.

Student A received twenty points out of a possible twenty-three points for every Question #1 in the non-graphic novels assessment. Student A received sixteen points out of a possible twenty-eight points for every Question #1 in the graphic novels assessments.

Student B received fifteen points out of a possible twenty-three for every Question #1 in the non-graphic novels assessment. Student B received sixteen points out of a possible twenty-eight points for every Question #1 in the graphic novels assessments.

The second question stated on the comprehension assessments administered after the first three quarters of the novels stated:

Where does the story take place so far?

The second question stated on the comprehension assessments administered after completing each novel stated:

Where does the story take place?

By the end of the implementation of the study, each student answered sixteen Question # 2's.

Student A received seven out of eight possible points for every Question #2 in the non-graphic novels assessment. Student A received six points out of a possible eight points for every Question #2 in the graphic novels assessments.

Student B received five points out of eight possible points for every Question #2 in the non-graphic novels assessment. Student B received six points out of a possible eight points for every Question #2 in the graphic novels assessments.

The third question stated on the comprehension assessments administered after the first three quarters of the novels stated:

When does the story take place so far?

The third question stated on the comprehension assessments administered after the completing each novel stated:

When does the story take place?

By the end of the implementation of the study, each student answered sixteen Question 3's.

Student A received one out of eight possible points for every Question #3 in the non-graphic novels assessment. Student A received zero points out of a possible eight points for every Question #3 in the graphic novels assessments.

Student B received zero points out of eight possible points for every Question #3 in the non-graphic novels assessment. Student B received zero points out of a possible eight points for every Question #3 in the graphic novels assessments.

The fourth question stated on the comprehension assessments administered after the first three quarters of the novels stated:

What is the problem in the story so far?

The fourth question stated on the comprehension assessments administered after the completing each novel stated:

What is the problem in the story?

By the end of the implementation of the study, each student answered sixteen Question #4's.

Student A received six out of eight possible points for every Question #4 in the non-graphic novels assessment. Student A received three points out of a possible eight points for every Question #4 in the graphic novels assessments.

Student B received three points out of eight possible points for every Question #4 in the non-graphic novels assessment. Student B received six points out of a possible eight points for every Question #4 in the graphic novels assessments.

The fifth question stated on the comprehension assessments administered after the first three quarters of the novels stated:

How has the problem been resolved so far?

The fifth question stated on the comprehension assessments administered after the completing each novel stated:

How is the problem resolved in the end of the story?

By the end of the implementation of the study, each student answered sixteen Question #5's.

Student A received four out of eight possible points for every Question #5 in the non-graphic novels assessment. Student A received two points out of a possible eight points for every Question #5 in the graphic novels assessments.

Student B received three points out of eight possible points for every Question #5 in the non-graphic novels assessment. Student B received one point out of a possible eight points for every Question #5 in the graphic novels assessments.

After all assessments were completed, each student completed a survey about his or her experience reading graphic and non-graphic novels.

The first question asked, "Did you enjoy reading the non-graphic novels?" Both students answered, "yes."

The next question on the survey asked, "Did you enjoy reading the graphic novels? Why?" One student answered, "Yes, it was interesting." The other student answered "yes."

The third question on the survey asked, "Which novel did you enjoy reading the most? Why?" One student answered, "Esio Trot." The other student answered, "The Boxcar Children."

The final question on the survey asked, "After reading graphic novels, would you like to read more graphic novels? Why?" One student answered, "Yes because it was interesting." The other student answered "Yes, fun."

### Chapter 5: Interpretation of Results

When evaluating the results of this study, it may be difficult to determine whether students with ASD perform better on reading comprehension assessments after reading graphic novels than after reading non-graphic novels. Student A performed better on all Questions #1-5 of the non-graphic novels assessments than Questions #1-5 of the graphic novel assessments. However, Student B performed better on Questions #1 of the graphic novel assessments than Questions #1 of the non-graphic novel assessments. Yet, the difference between scores was one point. Student B also performed better on Questions #2 of the graphic novel assessments than Questions #2 of the non-graphic novel assessments. Again, the difference between scores was one point. On Questions #3, Student B scored the same on the non-graphic novel assessments and the graphic novel assessments. Student B performed better on Questions #4 of the graphic novel assessments than Questions #4 of the non-graphic novel assessments. However, Student B performed better on Questions #5 of the non-graphic novel assessments than Questions #5 of the graphic novel assessments. Although Student A's scores were consistently higher during the non-graphic novel assessments, Student B's scores were inconsistent throughout the non-graphic novel and graphic novel assessments.

#### *Possible Explanations and Limitations of the Study*

There may be several reasons why Student A scored higher on the non-graphic novel assessment and why Student B scored inconsistently among the non-graphic novel and graphic novel assessments. First, the environment of the classroom, where the students read the novels and were assessed, may have contributed to the assessment results. During the time of the implementation of the study, several adults and students were present. There was a great deal of



movement happening throughout the room, as well as a high noise level. Also, there were several times other adults and students walked into the room. This is true for all instruction.

Another hypothesis for the students' assessment results could be due to how the students were feeling. For example, if the students had had a difficult day or did not have enough sleep the night before, their scores on the non-graphic novel and graphic novel assessments could have been impacted. With such a small number in the sample this can affect the outcome. An additional possibility for the students' assessment results could be a variability of the researcher's presentations of the novels and the assessments. Although the researcher read the written script each time an assessment was given to a student, there could have been variability among the presentations. This could influence the students' scores.

Another potential reason for the students' assessment results could be due to the students liking the subjects of some novels better than the subjects of the other novels. The subjects of two of the novels were more realistic than the subjects of the two other novels. If the students preferred one genre over the other, they may have performed better on the assessment of the novels they preferred. Another possible explanation for the students' assessment results could be that the students did not read the non-graphic and graphic novels consecutively. Due to student absences and changes in schedules the students did not read the novels every day. Because of this, there were periods when multiple days passed between readings.

Also, the students' assessment scores may have been affected since the non-graphic novels contained illustrations. Since a key component of graphic novels is the graphics they contain, the reliability of the study may have been affected since the non-graphic novels also contained pictures.

A final possible hypothesis for the students' assessment results was that the students were not instructed ahead of time about how to read graphic novels; nor was background knowledge accessed prior to reading any of the novels. According to Vacca (2007), it is important to base new reading skills relative to students' prior knowledge. Also, Gately (2008) suggests that by accessing background knowledge, students can connect what they have learned to what they are being taught. Further, Gately comments that the more the reader knows about a topic, the better the reader will be able to connect the readings with background knowledge. Finally, Gately states that when accurate background knowledge is supplied to children, the reading comprehension is increased. Since the students were not taught how to read graphic novels, nor were they given any background knowledge, their non-graphic and graphic novel assessment scores may have been impacted.

### *Conclusions*

Although there were several limitations to this study, some tentative conclusions can be drawn. First, students with ASD require instruction of background knowledge. The students should be taught how to successfully perform when completing assignments, assessments, reading novels, etc. Without a clear direction, students with ASD may struggle to understand what is required. Also, students with ASD should have an understanding about the subject of a novel prior to beginning reading. Having an understanding of the subject of a novel can greatly impact the students' comprehension (Gately, 2008).

Also, Student A and Student B scored low on all Question #3's, "When does the story take place so far?" and "When does the story take place?" By evaluating these scores, it can be

deduced that this question is particularly difficult for these students with ASD. Therefore, these students may need additional instruction and support when learning this key story element.

Finally, the study seems to support the idea that students with ASD are likely to enjoy reading graphic novels. Since students with ASD tend to be visual learners, as noted by Vacca (2007), the graphics in graphic novels are likely to be enjoyed by these students. Further, Student A and Student B both reported that they liked reading graphic novels and that they would both also like to read more graphic novels.

### *Suggestions for Future Studies*

There are several ways that future studies could be furthered using the results of this study. First, all encounters with students involved in the study should take place in a quiet environment with minimal distractions. Researchers should work directly with each student involved in the study. There should be minimal movement throughout the environment.

Another suggestion would be to include a larger number of students in the study. Since this study included only two students, the results of the study were likely affected by their circumstances. By increasing the number of students in the study, the reliability of the study will increase.

Also, future studies should include instruction of how to read graphic novels. Since graphic novels use a different format than non-graphic novels, students need to understand how to read graphic novels in order to comprehend what they are reading. Students should also be supplied with accurate background knowledge prior to reading any of the novels. Therefore they will be more likely to attach new information to existing knowledge.

An additional suggestion for future studies would be to increase the number of novels read by the students. Since the students in this study only read four novels, the data gathered through the study was limited. By using more novels, more data could be collected.

Another suggestion would be to choose novels that the students have a particular interest in. An idea would be to give each student involved in the study an interest survey prior to choosing the novels. If the novels chosen are about subjects of interest to the students, the students will be more likely to invest in the reading of the novels.

A final suggestion would be to choose non-graphic novels that do not contain illustrations. Since the graphic novels contain graphics, the non-graphic novels should not. If the non-graphic novels do not contain illustrations, it will be easier to determine if the inclusion of graphics affects reading comprehension.

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## Appendix C

The following script will be used every time the comprehension assessment is administered to each student.

“I am going to give you a short assessment about the novel you are reading. This test will not be timed. You will have as much time as you need to complete it. There are five questions on this test. You will be expected to answer each question. If you come to a question you do not know, try your best to answer it. Let me know when you are finished.”

