Simulation to Build Empathy in Adolescents With Autism Spectrum Disorders: a Video Modeling Study

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Thesis submitted to the Faculty of Graduate and Postdoctoral Studies in partial fulfillment of the requirements for a doctoral degree Education

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Abstract

Since a deficit in empathy is not only characteristic among individuals with autism spectrum disorder (ASD) but categorically used in defining ASD, it is of utmost importance to explore educational avenues to build prosocial skills among this group. This study sought to explore the primary research question: What impact does the implementation of an empathy-focused video modeling intervention have on frequency of empathic behaviour among adolescents with ASD? The secondary research questions examined were: In what ways does employing a video modeling simulation intervention using the *Model Me Kids Friendship* program impact the ability of adolescents with ASD to demonstrate empathic behaviour*?* How do adolescents with ASD express or speak about their empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship*? How do the Educational Resource Facilitators (teaching assistants) perceive the same individuals' empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship (MMF)*?

This mixed methods study explores 1 particular video modeling simulation program as a focused approach to building empathic behaviour among adolescents with ASD. The theoretical framework presented blends theory of mind, simulation theory, and psychological theories of empathic behaviour including the inherent motor, cognitive, and emotional components. Individuals with ASD may not learn empathic behaviours solely through observation as typically developing children do, but findings suggest that through video simulation, practice may, in fact, lead to increased empathic behaviour. The quantitative findings were not significant but did show increase in motor empathy behaviour ratings among intervention group participants. Support for video modeling as a vehicle to

teach empathic behaviour was provided by qualitative data collected over the course of 4 months contextualizing specific examples of empathic behaviour exhibited by participating teens with ASD. There is a link made between high levels of systematizing among teens on the spectrum (the drive to analyze and build a system) and video modeling as a means to foster empathic behaviour, thereby supporting an increased use of video simulation strategies to teach social skills among this group.

Acknowledgements

To Dr. Carole Senechal: You have instilled dedication in my work. Your commitment to not only my study but my personal well-being motivated me towards completion. To committee members Dr. Raymond Leblanc, Dr. Cameron Montgomery, and Dr. Jessica Whitely: Thanks for your constructive feedback, wisdom, and unwavering scrutiny. Ultimately, this study would not have been possible without the support of Dana Sheahan, Cathy Hill, Brent English, Joanne Geddis, Joanne Murray, the staff of the Regional Program, and the Peel District School Board. In the end, the willingness of students and support staff to try something new was not only imperative but truly inspiring.

Dedication

To all my family and friends who stood by me through the life changes required to reach this point. To my most loyal supporter, constant listener, and last minute editor: I love you mom! To my brother and his girls who let me camp out at their house for nearly two years: I love you and owe you always. To my friends (Kathryn Condotta, Amanda Denoble, Shenin Yazdanian, Katie Levalds, and Michelle Vivian) who kept me motivated when my inspiration waned and the end seemed so distant- I will always treasure your belief. One of you once said “if you are waiting to be in the mood to write, you will not do anything today. Just sit down and start.” It worked (those words have been my screensaver for two years). This would never have been possible without all of you!

List of Acronyms and Abbreviations

ABA applied behaviour analysis

ASD autism spectrum disorder

ERF educational resource facilitator (commonly known as teaching assistants)

MMK *Model Me Kids* video series (complete)

MMF *Model Me Friendship* video portion (intervention)

MT modularity theory of mind

ToM theory of mind

TT theory theory of mind

SSRS Social Skills Rating Scale

ST simulation theory of mind

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Chapter 1: Introduction and Description of the Problem

The rise of autism spectrum disorder (ASD) cases has captured the fascination of North American society—spanning from an American congressional bill to Oprah Winfrey's showcase of celebrity mothers coping with the inherent social complexities (Chandler-Olcott & Kluth, 2009; Renzetti, 2010). Current rates of incidence range from 1:94 in Ontario to 1:80 in the United States (Autism Ontario, 2012; Centre for Disease Control and Prevention, 2012). Social difficulties arise for individuals with ASD in reading abstract mental states, a skill needed for social participation (Bogdashina, 2006; Peterson, Garnett, Kelly, & Attwood, 2009; Repacholi & Slaughter, 2003). Work by Baron-Cohen (2002) defined the fundamental ability to empathize as a process that "involves an imaginative leap in the dark . . . our most powerful way of understanding and predicting the social world" (p. 248). Although popular cognitive empathy theory in the field of psychology often favours an approach which views empathy as an inherent ability that one develops to be able to put oneself in someone else's position, this study takes a different approach by exploring the complex relationship between empathy and theory of mind among adolescents with ASD. The ability to put yourself in another's position, in the theoretical framework that follows, is presented as not necessary in order to demonstrate empathic behaviour in social situations.

Current findings by mental health practitioners have drawn attention to children and teens who exhibit poor social skills as having a higher tendency to evoke negative responses that can lead to rejection, depression, aggression, and anxiety (National Association of School Psychologists, 2012). Current research in the field of Mental Health is pointing to a connection between individuals with ASD, poor social skills and developing mental health issues. Although there are various statistics for the prevalence of anxiety disorders in

children with ASD, ranging between 11 and 84%, either of those numbers has sparked immense concern among professionals, parents, and educators alike (Ketly Mental Health Resource Centre, 2012). Similarity, mood disorder diagnoses have been cited as affecting 24% of children diagnosed as being on the autism spectrum.

Studies that explore interventions to overcome social deficits for adolescents with ASD are extremely important in the current secondary school climate, where issues of bullying and mental health concerns are increasing at an alarming rate within North America. Recent statistics cited by Autism Speaks Canada support the growing alarm, as there is a child on the spectrum in every 110 births in North America (Autism Speaks Canada, 2012). This is concerning for parents, educators, and researchers as adolescents on the spectrum harbour feelings of peer rejection, social neglect, isolation, peer conflict, and lack close reciprocal friendships (Laugeson, 2012). This points to a pressing need to investigate the complexities of such social problems and find ways to teach adolescents with ASD strategies to overcome the barriers they face in everyday life. The current study seeks to explore video modeling as a method for teaching empathic behaviour to teens on the spectrum. When viewed in the light of rising concerns around the social experience of teens with ASD in the complex social world of high school, exploring interventions that could not only teach social rules but also potentially generalize to natural social situations is extremely important. This mixed methods study explores whether there is in impact in student empathic behaviour following the implementation of a video modeling intervention. Qualitative observational data was analyzed to provide insight into the perceptions of students and staff around whether or not social learning generalized to interactions with peers over the course of the study.

My experiences over the last decade as a teacher at the secondary level who works with students with special needs both in mainstream and partially integrated environments has led to an insatiable desire to find effective strategies for teaching social skills. It is within my work in the niche of Special Education that I have discovered my true passion. My previous school boasted the motto "Pursue Your Passion," and the words apply to not only the students with diverse needs but also the educational community that has always been supportive of my propensity to be a lifelong learner. The most effective practices I have developed as an educator have had two things in common: a collaborative approach and data-driven dialogue. When it comes to enhancing teaching practice and trying something new, I have always believed that educators can and must learn together. Education is a collaborative field, and it takes the entire school community to foster the education of the "whole child." Countless hours in meetings with teachers, resource staff, administrators, social workers, psychologists, and therapists have instilled my belief that collaboration is fundamental when it comes to exploring learning strategies and tracking the effectiveness of any targeted intervention. In the course of my own experience, I have discovered that the best teaching and learning happen when everyone, students and staff members alike, are engaged and valued. Collective idea generation requires time and trust, which are two qualities that I aspire to give selflessly to students and colleagues.

In many ways, the following study is the fruition of trust built through colleague collaboration and the time needed to build trust with the students we work with every day. My insatiable desire to learn and change my approach to best suit the needs of students has involved me in many collaborative learning projects within my school and board. One particular project that explored the use of assistive technology in enhancing verbal

communication skills among students with developmental disabilities and ASD brought awareness to the lack of data-driven dialogue among educators. One student in my English class named “Andrea” nearly six years ago had very limited communication skills, and I had observed that both peers and staff interacted with her very differently. Students did not speak to her but more “around” or “about” her. The more I worked with her, we established a relationship, and I began to use her journal writing as a way to increase my understanding of how she sees the world around her. I changed the journal writing method from allowing students to write about anything they wanted and began to form journal starters around how students felt, how they saw others, and what they wanted from those around them. “Andrea” was able to express herself, not verbally but through writing, and she felt secluded from her peers. One of her journal entries called for those around her to break her bubble and see her as a person. She wanted nothing more than for people to understand that just because she wasn’t speaking did not mean that she was not experiencing.

While working on a preliminary, and in all honesty nowhere approaching exhaustive, literature review for our funding application, I uncovered something startling that immediately reminded me of “Andrea.” In working with students with ASD for a number of years I had always had an underlying assumption that theorists and researchers alike were expanding knowledge for a common purpose: to better understand the daily realities and struggles of individuals on the spectrum in a world that is, largely, social. The more I read, the more I was lamenting the lack of balance between studies that sought to find causes and cures for individuals with ASD and investigations into what we can learn from people who experience, interact with, and express life in unique ways.

One video I came across on youtube nearly four years ago was the pivotal point in my own practice: It was of a girl named Amanda Baggs (Baggs, 2007b). The video portrayed Amanda moving, rocking, and making noises for nearly four minutes. There was no sense to be made until she used an augmentative communication device to explain the message she was trying to convey. On her website, Amanda explained that she attempted to explain how a person with ASD interacts with the world around them.

> It is about what kinds of communication and language and people we consider real and which ones we do not. It applies to people with severe cognitive or physical disabilities, autistic people, signing deaf people, the kid in school who finds she is not taken seriously as a student because she does not know a lot of English, and even the cat who gets treated like a living stuffed animal and not a creature with her own thoughts to communicate. It applies to anybody who gets written off because their communication is too unusual. (Baggs, 2007a, paragraph 9).

Amanda's perspective brought my memories of "Angela" back, and I found myself lost again in the lack of connection between theory and practice. The more I thought about it, the more I found myself drawn to "empathy deficit" that is, arguably, a characteristic of individuals with ASD but also the "empathy deficit" that others have in understanding the realities of living with ASD.

The current study explores the complex social skill of empathy and seeks to expand the understanding of the perceptions of empathic behaviour among individuals with ASD. The literature review chapter uncovers a palpable unbalance between the sheer volume of studies taking a medical perspective to understanding the empathy deficit inherent among individuals with ASD and the lack of studies which seek to validate interventions commonly

used to teach social skills among the group. Further, studies in the field of empathy and ASD predominantly lean toward viewing empathy through theory that is far too narrow and does not factor in the complex relationship between theory of mind, empathy, and the social learning of individuals with ASD.

This study poses an alternative approach to the concept of empathy, arguing that the outcome of empathy is driven by social experiences. Social experiences, in essence, provide the basis for empathic behaviour because an individual has felt the same way in the past and learned how to transfer that knowledge to social situations through interactions (Goldman 1993; Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000; Lewis, 1972). As a deficit in empathy is characteristic among individuals with ASD, it is of utmost importance to explore practical educational avenues, such as video intervention, to build empathic behaviour (Baron-Cohen, 2010).

Among social skills, a lack of naturally occurring empathy permeates the daily social interactions among adolescents with ASD, making the high school years particularly difficult. As much as teachers and assistants seek to carve out social skills learning opportunities among this group of learners, students on the spectrum struggle to integrate and interact with the peers around them in classes. In an effort to find a strategy that works with this group to focus on building capacity for empathic behaviour and learning social skills that will generalize to naturally occurring social situations, this study explores the effectiveness of using video modelling as a teaching tool. The subsequent study examines whether a video modeling intervention has any impact on empathic behaviour in classroom interactions in adolescents with ASD. Theory of mind, empathy, and simulation theories are explored and connections between them are established as they play both individual and

fused roles in the use of video modeling to teach social skills among this unique group of adolescents. Through this examination, the study explores how adolescents with ASD perceive their empathic behaviour and compares those results with the perceptions of daily workers who support the teens in an educational setting.

The following literature review paints a highly dichotomized field. Studies that explore the phenomenon of ASD ultimately take a medical model or social development model approach. The medical model is presented briefly to provide context for the more recent evolution of studies seeking to explore the social realities of children and teens with ASD. Studies in the social development model have influenced the current study which seeks to explore the social realities and motivations of empathic behaviour in an effort to enhance the daily social realities of individuals with ASD. Following the literature review, the theoretical framework is outlined situating the mixed methods study of empathy in simulation theory of mind. Quantitative and qualitative findings are then presented and subsequently analyzed to answer the research questions around the effectiveness of using a video modeling intervention to increase the frequency of empathic behaviour. In addition, perceptions of adolescents with ASD and the adults who work with them are explored to gain further insight into the complexity of empathic behaviour.

Chapter 2: Literature Review

Definition of ASD

In order to present an overview of the evolution of studies in the area of ASD, first it is necessary to define what the term means. Autism spectrum disorder (ASD) is a continuum of common communication and social characteristics among individuals with autism. Where an individual is placed on the spectrum is determined by symptoms, severity, age of onset, functioning level, and level of social interaction difficulties as determined by the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV, 2000). The term ASD usually refers to the three most common spectrum diagnoses: autism, pervasive developmental disorder—not otherwise specified, and Asperger's disorder (Autism Society Canada, 2011).

Indeed the triad of social, communication, and thinking impairments that are used to classify ASD reflect the pivotal role that empathy plays; the inability to act empathically permeates all three areas of impairment (Wing, 1993). This leads to problems recognizing the feelings of others on a daily basis and affects the social lives of teens with ASD. Recent work has presented inherent social impairments succinctly as poor social communication, social awareness, social motivation, and social cognition. Social awareness is needed in order for motivation to be present and drive an individual to socialize and communicate, but none of these processes are possible without social cognition. Social cognition is an area of social psychology which examines the ability of individuals to gather information about and understand the rules and concepts that govern our social interactions. Social cognition includes the ways in which we understand the social rules of etiquette, proximity, gestures, and inferences. The final area of poor social cognition encompasses the difficulties that

individuals on the spectrum have understanding the perspectives of others and, thus, ties directly to the ability to act with empathic purpose (Laugeson, 2012).

Earliest Studies of ASD: A Historical Glance at the Medical Model

A survey of seminal and current research paints an increasingly diversified field—although the diversity is much more recent. The earliest studies of ASD took a demographical and observational approach to explore causes of and cures for the complex disorder. Studies that subscribe to this theoretical perspective typically employ a particular rhetoric and approach to their research, with a specific aim. In my view, the rhetoric chosen by the medical deficit model is negatively charged and laden with terms like deficit, defect, lack, and handicap which are used to show abnormalities in individuals with autism. This view of autism as a syndrome or disease leads to etiological and heuristic perspectives in the survey of early studies in the area of ASD.

The historical context of studies of ASD. Kanner's "Autistic Disturbances of Affective Contact" (1943) was the earliest investigation into this phenomenon of children with similar, fascinating peculiarities and began the initial surge of studies exploring ASD from a medical perspective. This work consists of case summaries with discussion around the common features of age of onset, repetitive behaviours, rituals, speech patterns, memory patterns, and social interactions. The characteristics Kanner describes are all in terms of "disorder, lacks, deficits and inability" (pp. 40–41), and in doing so, this seminal piece established a negative rhetoric and tone that would be adopted in studies within the medical model for decades. His work seeks to determine a cause, concluding that the common denominator for all his cases is the way their parents treat them. This widely accepted theory argued that "refrigerator mothers" who were not "warm-hearted" caused autism in their

children (p. 50). As the earliest work in the field, Kanner's use of negative rhetoric has been adopted by the majority of studies that fall within the medical model. However, the impact of Kanner's work lies in bringing awareness to autism and inspiring researchers to draw attention to a group of individuals who are very misunderstood.

The earliest literature review in the field of autism provides a succinct summary of the characteristics of the medical deficit model (Rutter, 1968). Rutter's (1968) work points to the etiological focus of medical studies in his section discussing whether autism is a "syndrome" or a "disease." He makes broad statements such as: "In addition to these rather global views of autism as a brain damage syndrome there have been a number of more specific hypotheses concerning possible biological or physiological factors in the aetiology of autism" (p. 2). Rutter's (1968) work provides evidence that once a researcher adopts one side of the theoretical binary the contrasting theory is discounted, as no attention is given to the early social studies that are discussed in the second portion of this paper.

Folstein and Rutter (1977) serve as an example of the continued prevalence of these trends within the medical deficit model with their exploration of the genetic and prenatal environment causes of infantile autism. This study applies Kanner's theory of "inborn defect," building on two further reasons for suspecting hereditary influences. Folstein and Rutter point to the rate of autism in siblings and family history of speech delay as proof of this genetic link. Although at times this study does not sound very medical to the modern reader, it does build on the ideas of strong genetic determination, the role of biological hazards in the prenatal period, and the role of environmental influences in their inquiry into the "causation of autism" (p. 324).

Markram, Rinaldi, and Markram (2007) similarly employ an etiological perspective in their study of "The Intense World Syndrome" in which they propose an alternate hypothesis for the causes of autism. The way they frame their topic as a "devastating neurodevelopmental disorder" (p. 77) makes their theoretical ontological and axiological beliefs immediately evident. They believe that this "handicap" is not only "devastating" but proceed to study the potential environmental "triggers" for the "devastating disorder." The use of negative rhetoric reinforcing the fundamental goal of curing autism is transparent when Markram et al. claim that "developing the ultimate cure for autism lies in being able to prevent this attack and reverse its effects once it has occurred" (p. 79).

Two recent studies testify to the continued dominance of the medical deficit model and exemplify the newest wave of studies aimed at determining the causes and finding a cure for autism. For example, Richler et al. (2006) investigated the often cited link between onset of autism and the measles-mumps-rubella vaccine. They performed a study of 351 children with autism and 31 typically developing children to determine if this is, in fact, one of the "causes" of autism. Despite reaching the conclusion that there was no evidence that onset of autistic symptoms or of regressions related to the measles-mumps-rubella vaccination, the authors still conclude that "even larger sample sizes may be necessary to examine these possible associations" (p. 315). Likewise, Woodard, Groden, Goodwin, and Bodfish (2007) employ the heuristic perspective in their exploration of drug-therapy treatment of autism. The study is a mixed group, double-blind, placebo-controlled, ABAB design to examine how safe and efficient dextromethorphan is in the treatment of "problematic behaviours and core symptoms" in children with autism.

Neurobiological studies. Dalton et al. (2005) exemplify the new wave of such studies in the neurobiological field while reinforcing the continued use of deficit rhetoric and the ontological belief that autism is a disease that must be cured. Their study fits within the many that explore the brain patterns in individuals with autism arguing that there is a "deficit" in reading the reactions of others on a neurological level. In the same vein, Elder, Dawson, Toth, Fein, and Munson (2008) explore the relationship between head circumference and incidences of this "highly heritable disorder" (p. 1109). These studies highlight an issue evident in many studies within the medical model because the heredity link is nowhere near a consensus within the vast field of autism research. The medical deficit perspective rhetoric is seen in the chosen definition of autism as "a lifelong neurodevelopmental disorder" (p. 1108). This study demonstrates just how entrenched the deficit rhetoric and etiological aims are within the medical model. The article concludes that their findings "could decrease the average age of diagnosis of autism by a year or more by using a practical and low cost procedure with data that are widely available and routinely used in regular visits to pediatricians" (p. 1110). I tried to find examples within the medical model that did not display these underlying ontological and axiological aims to no avail.

From this synthesis of studies that fall within the medical deficit model a number of patterns emerge from my analysis. The first is the presence of specific rhetoric that uncovers ontological and axiological beliefs about autism held by the researchers. However, more important and often overlooked is the obvious lack of practice-based applications of the medical model. For example, Lovaas, Koegel, Simmons, and Long's (1973) study can be viewed moving toward a more social learning approach. ABA is based on the interaction between a person, his/her beavhiour and the environment around them. While exploring

whether or not ABA is effective in modifying behaviour the missing link for educators is evident. While useful for practitioners, the personal facet demonstrating how such an intervention would impact individual social interactions is completely overlooked. For individuals on the spectrum, their families, and staff who work with them, ABA is an effective tool, but the entire purpose is to understand why an individual behaves a particular way in a particular situation. While functions of behaviour is extremely important knowledge in the field of ASD research, knowing how that impacts daily life is, arguably, of superior importance to individuals with ASD seeking to interact in a highly social world.

The medical deficit model applies to a variety of studies that investigate theories of hereditary causes, environmental causes, neurobiological causes, and methods for earlier detection and possible cures. Studies on this side of the binary opposition are entirely focused on the prevention and cure of autism and do not easily translate into practice. As a result, the life experiences and various realities of individuals with autism are not really explored; in fact, very few (outside of Kanner's seminal work) even acknowledge the complex lives and experiences of those living with autism. Perhaps the reason for the dominance of this side of the binary opposite lies, arguably, in the quest to "find the cure." However, 60 years later, there is no cure and no consensus of accepted causes. Despite this reality, the sheer volume of studies published within this theoretical perspective in the last few years points to a clear cultural position of dominance.

With diagnoses of ASD continually rising, it may be the case that funding for studies seeking to find a cure for ASD is driving the sheer volume of studies exploring this particular facet. The question arises: Whose interest does the binary serve? From the popularity of the medical deficit model, it appears that the position of power gained through

the binary has benefited that model much more than the social development model. Chandler-Olcott and Kluth (2009) discuss the popularity that autism has recently found spanning from an American congressional bill to Oprah Winfrey's showcase of celebrity mothers raising children with autism. Most coverage, both media and research based, is not balance because an "autism diagnosis is still more likely to be characterized as tragic than it is to be presented neutrally or positively" (Chandler-Olcott & Kluth, 2009, p. 548). Unlike most disabilities, autism is on the rise and is present in all people at an equal rate, which has led to a group of parents who are financially and socially in positions to advocate for additional funding of medical studies. Such concerns have been raised by Begeer, Bernstein, van Wijhe, Scheeren, and Koot (2012) who point to the fact that ethnicity and socioeconomic status do not influence the prevalence of autism. As much as studies in the medical model have brought initial awareness to ASD, recent work has shown an increasingly diversified field of research.

As studies that apply such an approach do not translate easily into educational practice, they are not extensively explored to create context for the current study; the remaining review focuses on the themes that have arisen from a social development framework and have brought increased understanding to a disorder that is largely misunderstood (Dudley-Marling, 2004; Meyers, Mackintosh, & Goin-Kochel, 2009; C. Moore, 2008; Teunesse, Cools, van Spaendonck, Averts, & Berger, 2001).

All of this lies in stark contrast to the reality of a label that is culturally constructed and has "no biological markers" on any of the disorders classified on the spectrum despite the continued prevalence of the medical deficit model. The next section focuses on the other side of the binary opposition that is becoming increasingly diversified. Many of these

studies have arose from the realization, first made pertaining to learning disabilities, that most disabilities are socially constructed labels that are culturally reproduced (Dudley-Marling, 2004; C. Moore, 2008). With that realization came a drastic shift in axiological beliefs as evidenced in research conducted under the social development model. Generally speaking, studies in the social development model seek to explore the complex realities of individuals living with ASD. Although a vast field, the focus is narrowed to how individuals with ASD learn to apply social behaviour skills in everyday life.

Social Development of Empathy in Typical and ASD Development

From a cognitivistic viewpoint, empathy is defined as "an experience in which people participate in or share the emotional state of somebody else on the basis of the other person's expression and/or their situation" (Bischof-Kohler, 1991, p. 245). Within the discourse of empathy studies, historically two theoretical approaches have emerged: cognitive empathy and emotional empathy (also commonly referred to as affective). Cognitive empathy is defined as understanding another person's perspective. In contrast, emotional empathy involves an observer's emotional response to the affective state of others (Baron-Cohen & Wheelwright, 2004; Piaget, 1932, 1936/1952). The earliest studies into the development of empathy involved the use of pictures and stories to discuss emotions. Such work discovered that beyond identifying emotion in the picture, cognitive and emotional empathy was not present in young children under the age of 5 (Feshbach & Feschbach, 1969; see also Bischof-Kohler, 1991).

Presenting Empathy as an Integration of Cognitive and Emotional Perspectives.

Barnett (1987) used Feshbach and Feshbach's (1969) model of empathy, which integrated the cognitive and emotional components outlining that an empathic response requires not

only the ability to identify emotional states but further to take the perspective of another person and evoke a shared response as well. Barnett's study was groundbreaking in the attention given to socialization factors that contribute to the development of empathic responses in young children. A recent study by Smith (2006) explored empathy from an evolutionary perspective, arguing that empathy is typically developed through socialization. Holistically, this social development model has been driven by the underlying notion that individuals learn how to apply social behaviour through observation, imitation, and modeling. Recently, researchers have argued that empathy consists of three, not two, components: cognitive, emotional, and motor empathy (Bons, Rommelse, Scheepers, & Buitelaar, 2010; Spink & Heinström, 2011; Welch, Lahiri, Liu, Weller, & Sarkar, 2009). Simplistically speaking, emotional empathy is used to reference the experience of emotions that are consistent with the situation and in response to those of peers. Motor empathy, a newer term, refers to "unconsciously mirroring the facial expressions of another" (Bons et al., 2010, p. 109; see also Bal et al., 2010; Wright, Clarke, & Jordan., 2008). The addition of emotional and motor empathy to the widely accepted "simply cognitive" definition of empathy in the current study points to a growing view that exploring empathy solely through a cognitivistic lens is an oversimplified approach to an extremely complex construct.

Inherent Lack of Empathy Among Individuals with ASD. A plethora of studies have found that individuals with ASD appear to lack the social development of empathy. Waterhouse (2000) stated that when a child has difficulties interpreting social cues, he or she has little awareness of the social norms that typical children learn through social interactions. Orsmond, Wyngaarden Krauss, and Seltzer (2004) also highlighted the importance of reading social cues in building relationships in life. The study found that of

the 235 participants, only 19 individuals had one friendship that met the criteria of "same aged friend with whom varied, mutually responsive, and reciprocal activities were engaged in outside of organized settings" (p. 251). Most important was that almost half of the sample was reported to have no relationships with peers that met the above criteria either inside or outside of prearranged settings.

This is an area that researchers and educators can hone in on to find strategies and interventions to heighten emotional understanding among individuals with ASD. The ultimate goal, thus, is to build relationships, and educators can scaffold social learning by finding ways to practice social skills in prearranged settings in the hope of transferring those skills toward generalization. Temple Grandin (2006) explained her struggle with ASD as having to explicitly learn empathy because she could not learn such social skills on her own through natural observation. She states that her "emotions are simpler than those of most people. I don't know what complex emotion in a human relationship is . . . complex emotional relationships are beyond my comprehension" (p. 91-92; see also O'Neill, 1999).

Studies Exploring Empathy Among Individuals with ASD. The studies mentioned below demonstrate that there is no shortage of studies that explore the relationship between empathy and ASD and argue that people with ASD can mentally picture the feelings of others but do not socially develop this ability at a young age. Grant, Boucher, Riggs, and Grayson (2005) confirmed the findings of Blair's (1996) report that children with ASD could make the "affect-related distinction" between moral rules and social rules but have extreme difficulty applying this knowledge in social situations. Likewise, Scambler, Hepburn, Rutherford, Wehner, and Rogers (2007) confirmed that children with ASD responded half as often as control groups to emotional situations, but

argued that individuals with ASD have more ability to read and express emotion than credited by early research (see also Capps, Kasari, Yirmiya, & Sigman, 1993; S. Rogers & Pennington, 1991; Yirmiya, Sigman, Kashari, & Mundy, 1992). There is such a wide disparity between studies that say individuals with ASD cannot display or feel empathy and those that have argued that view is misleading and we require much more research in this area.

Theory of Mind and Empathy

Theory of mind (ToM) has been expanding since the late 1970s and has created the scaffolding necessary to build a bridge between research and everyday practice. In the field of ASD study, Baron-Cohen (1995) developed a groundbreaking theory that the "categorizing that goes on in the minds of most of us all the time— the automatic connecting of events and people that seem to go together—either doesn't happen or happens in different ways in individuals with [ASD]," a condition he fittingly termed as mindblindness or ToM (Baron-Cohen, 2006, p. 35, 1989, 1990, 1995, 2001). Baron-Cohen compared mindblindness to colour-blindness because people with ASD cannot actually imagine what it is like to think about the mental feelings of others, just as people who suffer from blindness cannot imagine seeing the world in colour. As a result, most individuals with ASD are not able to exhibit evidence of cognitive empathy. Frith (1989) argued that Baron-Cohen's ToM has maintained such a hold in the field of ASD discourse because it provides researchers "with the ability to predict relationships between external states of affairs and internal states of mind" (p. 77).

To assume that all individuals with ASD cannot be taught to feel or show empathy is not supported by studies that found that individuals with ASD can develop ToM abilities

through time; despite an initial struggle to understand the emotions of others, the potential is evidently there, although it remains largely hidden. In working with children with ASD, Baron-Cohen (1995) operationalized ToM as a system used to infer a range of mental states from the behaviour of others. Through this work, Baron-Cohen concluded that children with ASD do not understand beliefs at the 3- to 4-year-old level (p. 69). Baron-Cohen, therefore, argued that empirical research proved that children with ASD do not naturally learn empathy through social interactions the way a typically developing child would observe and develop empathy. ToM, thus, has developed to postulate that in order to acquire knowledge of the nature of people's minds, one must be socially engaged with others (Hobson, 1993). The findings of Baron-Cohen (1995) and Hobson (1993) provided further support for the notion that emotional empathy, which requires emotional responses to situations and interactions with peers, is an area that is underdeveloped (but not necessarily impossible) among individuals with ASD. As a result, exploring interventions aimed at increasing emotional, cognitive, and motor empathy could potentially lead to greater social interactions for individuals on the spectrum.

Bauminger and Kasari (2000) presented a novel approach in their study of 22 children with ASD and found that these children were lonelier than their typically developing peers. The approach argued that both emotional and social-cognitive loneliness are relevant to the study of autism because:

> loneliness is linked to a basic ability to know about relationships and to feel and experience emotions vis-à-vis this knowledge, the study of loneliness may contribute to the debate as to whether autism is a disorder of underlying cognitive processes or a disorder of basic, underlying affective or emotional processes. (p. 477)

Further, Bauminger and Kasari postulated that these two central views about the core deficits in ASD lead to predictions about the feelings and understanding of children with autism that are vastly different. As a result, a cognitive approach predicts that cognitive-specific deficits are tied with children's inability to understand the thoughts and reasons of others. This prediction is dependent on an inherent gap that the child perceives between his or her own social experiences and those of their peers. In contrast, the affective theory views autism as a "biological disorder of affective engagement and relatedness with others" (p. 478). Thus, Bauminger and Kasari held that children with ASD lack the ability to emotionally experience relationships and present the two approaches towards empathy as two joined sides of an intricate issue; the complexity of the construct of empathy is discussed at length in the theoretical framework.

Empirical studies of ToM with respect to ASD. Research supporting ToM through empirical findings have commonly used what developmental psychology called the false belief (or Sally–Anne) test to measure a person's social cognitive ability to attribute false beliefs to others (Wimmer & Perner, 1983). Researchers conducting the false belief test show participants (usually children) a simple scene involving two dolls (Sally who has a basket and Anne who has a box). In the skit, Sally puts a marble in her basket and leaves the room. In her absence, Anne takes the marble out of the basket and puts it in her box. When asked where they think Sally will look, they "pass the test" if they understand that Sally will look in her basket before realizing that her marble is missing. Baron-Cohen employed the test a number of times with the same findings: children under the age of 4, along with 85% of older children with ASD, will answer "Anne's box," appearing to not know that Sally is unaware that her marble has been moved. The results of the Sally-Anne

test indicated that if the child cannot take an alternative perspective he or she will indicate that Sally believes—as he or she does—that the marble has moved. The findings of the false belief tests among individuals with ASD tie directly to cognitive empathy—the inability to take an alternative perspective is precisely what causes the observable lack of cognitive empathy.

As ToM has evolved, it has consequently led many researchers to explore the effect of specific treatments on changing the behaviour of individuals with ASD (Bagatell, 2007; Carruthers & Smith, 1996; Currie, 1996; Eisenberg, 2000, 2006; Honig & McCarron, 1988; Lord, 1993; Lovaas, Koegel, Simmons & Long, 1973; Morrison & Bellack, 1981; K. Rogers, Dziobek, Hassenstab, Wolf, & Convit, 2007; S. J. Rogers & Pennington, 1991; Samet, 2003; Sigman, 1998). Researchers continue to state, however, that despite consensus in the field of autism research that socioemotional relating is impaired in children with ASD, data-driven evidence for empathic responding difficulties is lacking and rudimentary at best (Glossop, 2007, p. 3). The few studies that have explored social realities among individuals with ASD have discovered peer relationship difficulties and lack of friendships as common and unifying sources of "frustration, anxiety, and confusion that sometimes precipitated inappropriate behaviour"(Church, Alisanski, & Amanullah, 2000, p. 17).

The Quest to Understand Social Skills Deficits. Although studies in this area have also cemented a neurological foundation for the lack of empathic response among individuals with ASD, there are few studies examining interventions to increase emotional responses in peer interactions (Greimel et al., 2010; Wright et al., 2008). Support for the ability to emotionally respond among this group has been proven in studies where the verbal mental age of children in the control group and children with ASD were equivalent and no

impairment in emotional recognition was observed (Adolphs, Sears, & Piven, 2001; Ozonoff, Pennington, & Rogers, 1990). Perhaps, rather than focusing on the lack of empathy understanding among individuals with ASD, it is best to view it as an issue of regulating emotions and reflecting on those emotions.

Many studies have employed self-ratings of individuals with ASD as a means to gain greater understanding into their perspective when it comes to complex social skills. Researchers have sought to understand how individuals with ASD perceive their own behaviour and how they actually interact with those around them. The employment of self-ratings itself brings an inherent complexity that warrants discussion at this point. Perhaps the universal reason for the prolific use of self-ratings among individuals with ASD is that:

> If one wants to know what a person is like, the obvious solution is to ask him or her. Many people assume that this is the best approach; in other words, the self is often considered the single best expert when it comes to knowing how a person typically behaves. (Vazire & Mehl, 2008, p. 1202)

In effect, self-perception is useful precisely for the inherent bias; the desire to create and maintain a positive self-concept when rating oneself is as insightful as the discrepancies when others rate the same individuals. Although there are a number of studies that include self-ratings as part of data collection, very few highlight the use or function of the type of data. Although studies in a variety of areas have incorporated self-ratings into data collection, very few seek to highlight what is important in the perceptions and more or less use self-rating as a confirmation of a hypothesis. For example, Kavalam (2007) framed the study with the belief that children and adolescents would report themselves as having higher or more adequate social skills as opposed to parent ratings. However, findings indicated that

was not the case, and the use of self-rating was questioned. Other studies supported a multirater approach to ensure there is a more valid measure of perception that goes beyond simply trusting the individual's perceived level of what is being measured as valid. Studies confirm that while the level of agreement between rater groups often varies significantly, it is argued that "social skills are best studied with multiple informants" (Kalyva, 2010, p. 1206).

Studies in this area have confirmed the importance of needing to collect information on social behaviour from the individual himself or herself as the way someone interacts with his or her environment and perception are key factors that an observer may not or cannot have access to in their ratings of someone's behaviour (Junttila, Voeten, Kaukiainen, & Vauras, 2006). While self-ratings were not widely used in the past to collect data, studies since the late 1990s are increasing in use in order to learn about personal perception and also as a way to supplement the judgements made by others (Hope, Rapee, Heimberg, & Dombeck,1999). Self-ratings and reports are a source of data that cannot be provided by others and, despite likely reflecting a biased perspective, there is much to learn from that fact in itself (Fagan & Fantuzzo, 1999).

The reasons outlined in such studies provide insight into the importance of including such ratings; even though it may not be an accurate rating when compared to parent/teacher ratings, the data serve the higher purpose of exploring the complexities of perception among this unique group. One study which highlighted the advantages and disadvantages of using self-rating drew to attention that the most obvious source of data about oneself is oneself; the only way to learn about someone's feelings or internal motivation is to ask him or her (Westen & Weinberger 2004). Koning and Magill-Evans (2001b), in particular, explored

social and language skills in adolescent boys with Asperger syndrome and set out their primary interest in measuring social perception. They were careful, however, not to have only self-rating as their measure of social skills and included parent and teacher ratings as well. The use of self-rating provided an avenue for discussion around how aware the boys were of their own social deficits. Koning and Magill-Evans's rationale informed the current study wherein the goal is to gather information about how participants perceive their behaviour and compare it to ratings by adults around them.

Koning and Magill-Evans (2001a) confirmed that adolescents with ASD "rated themselves significantly higher than did their teachers and parents on total scores" but also point to the fact that there may be a different focus for different raters (p. 33). Self-ratings give an outside observer an understanding of how the person sees himself/herself or can even express the desire to improve oneself in higher than expected scores. Both self-ratings and observation ratings give very unique information, but both are accurate in presenting two very different perspectives, and researchers have used this tool as a way to understand more about social skills among individuals with ASD (Sedikides & Gregg, 2008; Swann & Read, 1981; Taylor & Brown, 1988).

Despite the plethora of research studies examining false belief abilities in children with ASD, findings are still largely inconclusive in terms of the reason for and impact of the social skills deficit. This is precisely why there is an inherent need for self-rating as a tool when social skills are explored. Bauminger and Kasari (1999) argued that there needs to be a change in research focus to address the complexity of social skills among this diverse group. Baminger and Kasari vehemently held that despite "persistent problems in social functioning among autistic children, and the potential link between theory of mind abilities

and social skills, it is important to have a better understanding of these skills in autism" (p. 86). The plea that the link must be used in designing interventions to improve functioning among children and adolescents with ASD in naturally occurring social situations was an inspiration and guided the direction of the current study. Ultimately such information should assist in designing interventions to "improve functioning of [children with ASD] in naturally occurring social situations" (p. 86).

As a pragmatic teacher and researcher, I see an easily applicable daily teaching strategy that may increase the inherent empathy deficit among adolescents with ASD. By focusing on the social experiences of students with ASD, teachers can find specific areas of need and provide individualized interventions. Just because a person does not socially interact with peers does not mean that they do not want to. My experiences working with these unique students brought awareness of wanting to have friends and fit in with peers. A student, "Jason," I worked with three years ago had immense difficulty having conversations with peers. Jason frequently began a conversation with a question, and once a peer has answered it he would just stand there waiting for the conversation to continue. I discovered Jason wanted to talk to his peers and tried to on a daily basis; he just did not know how to go about having conversations with those around him. The goal was to develop a strategy to facilitate his communication skills when it comes to socializing with peers and lead to a greater understanding of social contexts. Jason was really interested in comic book heroes, so we discussed his favourite characters and why he liked them best. When we reached Wolverine, I asked him if Wolverine was more social than some of the others he had mentioned. He said "that is why he is cool. Everyone likes him. He talks to everyone. He is one of the x-men." This led me to develop a power card that centers around Wolverine's

character and his friendships in the comic books. We were able to spend time reviewing how to initiate and keep a conversation going, and with repeated modeling and practice Jason was able to make friends and increase his socialization with peers. Modeling has had an immense impact on the practice of individual educators (such as myself) working within the field and social gains of individuals with ASD. There needs to be a connection in research evidence to support the effectiveness of such teaching and learning strategies.

Use of Imitation and Modeling With Individuals with ASD.

While there is a wealth of literature supporting the use of imitation and simulation with students on the spectrum there is a marked lack of studies that explore the empirical findings of such interventions. In particular, there are limited studies at this time that explore similar research designs, methods or outcome measures used in the current study. The following is a review of the research that supports the use of imitation and modeling with students with ASD with the aim of creating context for the findings of this project.

A study by Cesaroni and Garber (1991) explored ASD through two firsthand accounts (a teenager and a man) who argued it was unfair to say that people with ASD lack empathy and are unable to take the perspectives of others. While empathy implies the capacity for participating in another's feelings or ideas, one participant stated that through practice and imitation he was able to project his own feelings to those of others. Such studies draw on a wealth of research supporting simulation theory (ST; discussed at length in the theoretical framework section) which includes echoing, pretending, attributing intention, and imagining (Harris, 1992; see also Davies & Stone, 1995; Goldman, 2000, 2001; Gordon, 1995, 1996; Heal, 1995, 1998). ST assumes that experience plays a formative role because, through practice and social interactions, mentalizing abilities are improved in children. In

the upcoming theoretical framework, the three main approaches to theory of mind are discussed briefly to support the incorporation of simulation theory to the current investigation of the use of video modeling to build and generalize empathic behaviour.

Practitioners and parents alike have created many practical resources that attempt to foster prosocial skills among individuals with ASD through imitation and modeling. The interventions that have been developed in the last decade include social stories, social skills training groups, self-management training, activity-based intervention, peer mediated intervention, and friendship training curriculum. These strategies focus largely on imitation, which is only one component of modeling. Imitation involves learning through mimicking and practice where as modeling can be much more broad. McAfee (2002) and Winner (2008) exemplified this shift toward education-based interventions grounded in ToM; they established curriculum for high functioning individuals with ASD focused on recognizing and developing prosocial skills through opportunities to memorize and practice social skills. There is no end to the resources available to teachers focusing on the 'hidden curriculum' which aims to directly teach social and behaviour rules to children and teenagers who struggle making and maintaining friendships.

One particular social intervention tool that used imitation to teach social skills among individuals with ASD is Carol Gray's (2002) landmark resource *My Social Stories.* This book of narratives has led to an eruption of simulation-based strategies and digital interventions to target prosocial behaviour in children with ASD. This intervention involves creating short stories that describe social situation applicable to the daily life of the student. The stories are created by predicting social situations that may have or will be challenging for that individual and focus on the appropriate response. Through imitation of social

situations, social stories are one avenue to directly teach and allow students to learn social skills in a controlled environment.

Similarly, there has been much development in the area of training groups, where social skills are taught in a step-by-step manner where the aim is to break down complex social behaviours and teach the appropriate skills for managing real-life situations through imitation and practice. Laugeson et al. (2009) at the University of California, Los Angeles have taken this idea of imitation and modeling as a way to teach social skills in a new direction and brought attention with the success of their Program for the Education and Enrichment of Relationship Skills (PEERS). The program is built around the belief that social skills are not an art but rather a science. The focus of the PEERS program is that the scenarios and role-plays involve things that teenagers would actually say and do to each other as opposed to how an adult would act in the same situation. This idea that social skills can be explicitly taught through the use of ecologically valid scenarios is one that has built upon the idea of simulation with direct teaching, modeling and role-play. However, there is very little research available to support the growing call for such interventions and the success rates of programs like PEERS (which only began in 2009). Recently, Laugeson and her team have collected data, with favourable results finding the program effective. Initially, it was not known whether the new skills taught persisted with teens once the classes were completed, but recently a follow-up study was completed and the findings indicated that the skills taught stayed with the teens. Laugeson (2012) has reported significant improvements in social responsiveness, social cognition, and overall social skills (cooperation and assertiveness in particular). In my experience with teenagers with ASD, interventions that focus on simulation through imitation, modeling, and role play not only engage students but

also provide a way to create controlled situations in which to practice social skills and find ways to interact with peers through practice. This knowledge has grown out of my practice and led to the current examination into whether or not using video modeling to simulate social situations requiring empathy would lead to changes in empathic behaviour or perception of empathic behaviour among adolescents with ASD.

Many practitioners are recognizing the value in using video modeling and structured teaching as a means to develop both life and social skills (Franzone & Collet-Klingenberg, 2008). Corbett and Abdullah (2005) provided a succinct definition of modeling as "the process by which an individual or model demonstrates behaviour that can be imitated" (p. 1). The main advantage of video modeling is the possibility of repetitive viewing because, the greater the exposure, the more likely it is for skill acquirement and generalization. With video modeling, students can view, learn, and practice skills in a controlled environment. Students can stop, repeat, and slow down videos to allow for various processing speeds and ensure that teens can repeat the social situations as much as possible. The rationale for using video modeling with this particular group of students is that they will learn these social skills in a safe environment and not in naturally occurring social interactions where they can be hurt. However, with practice and imitation, the skills acquired may transfer to natural social settings. This is, in essence, the science of social skills—the formulaic way that these behaviours can be taught and practiced. Behaviours are played back not to show what they are doing wrong but rather to teach proper behaviour (Reichow & Volkmar, 2010).

Empirical studies of simulation interventions with ASD. Williams White, Keonig, and Scahill (2007) conducted a meta-analysis of all published studies of group social skills interventions (including simulation-based studies and other types) among children with ASD

between 1985 and 2006. Their study concluded that "unfortunately, only preliminary evidence is available regarding the efficacy of structured curricula and specific treatment strategies. [It] is an understudied, but worthy, candidate for further development and testing" (p. 1866). Similarly, Autism Ontario published a document in late 2011, aptly titled, *Social Matters: Improving Social Skills Interventions for Ontarians with Autism Spectrum Disorder*. In this document, Autism Ontario outlined key goals and interventions for people of any age with an autism spectrum disorder. They surveyed various community partners in Ontario who provide schools, individuals with ASD, and families with social skills interventions and found that there is no consistent curriculum or intervention used at this point. Their findings were that 70% of social skills training programs are done as a social skills group while less than 10% are done on an individual level (Autism Ontario, 2011, p. 11). The study looked at various types of interventions to determine whether they are supported as evidence-based practices showing measurable cognitive, behavioural, emotional, or social gains in more than two group research studies. The types of interventions analyzed were social stories, social skills training groups, cognitive behaviour therapy, activity-based groups, self-management training, peer-mediated interventions, friendship training (including PEERS), and video modeling. Based on all of these reviews, only video modeling met the criteria as an evidence-based practice. As a result, Autism Ontario suggested increased use of the strategy in Ontario but also highlighted the need for individualized interventions happening outside integrated environments. Others have voiced concerns about intervention, including Bandura who "argued that learning will not occur unless the models are attended to and perceived accurately. He posited that personal and environmental factors are interdependent, resulting in a continued reciprocal interaction

between the person and the situation" (DiSalvo & Oswald, 2002, p. 199). By extension, for teens on the spectrum in an integrated classroom when there is a specific intervention in place that involves modeling, this may not prove effective in promoting socialization with peers. Most studies have found that without specific intervention in an environment that allows for repetitive practice, typically children with autism are even less likely to attend to the social behaviour of their peers if the peers are not making the effort to instigate a social interaction. Similarly, Wang and Spillane (2009) conducted a meta-analysis of 38 research studies focusing on social skills interventions among individuals with ASD, which included 11 studies on video modeling, and also cited strong support for video modeling as an intervention.

Methodologically speaking, the effectiveness of simulation among individuals with ASD has been explored through various research designs, leading to an ever growing, diverse body of literature (Baker, Lang, & O'Reilly, 2009; Bellini, 2004; Carrola, 2006; Hillier & Allinson, 2002; S.A. Johnson, Filliter, & Murphy, 2009; Morrison & Bellack, 1981; Murray, 2007; Nikopoulos & Nikopoulou-Smyrni, 2008; Ozonoff & Miller, 1995; Robinson, 2008; S.J. Rogers & Pennington, 1991; Silver & Oakes, 2001; Slavin, 2009). The measures employed by these empirical studies predominantly include a self- or teacher rating of social behaviour (either the predominant Social Skills Rating Scale or an alternative measure of social behaviour) which are analyzed to show change in behaviour. Such intervention research supports the effectiveness of the practice-based implementation of simulation and modeling in increasing empathic behaviour among individuals with ASD.

Collectively, these studies have sparked interest in exploring the various roles that simulation can serve in teaching individuals with ASD to apply social skills in everyday life

(Cunningham, 2009; Reeve, 2001). The common components among interventions are the focus on social skills and social behaviour through modeling of various types and tracking their effectiveness. Components found to be effective included the use of visual aids, concrete rule based presentations of social behaviours, and demonstrating examples of appropriate social behaviours and inappropriate social behaviours for comparison. One particular component that is highlighted in all studies involving simulation with individuals with ASD is the focus on using highly visual materials. Whether it be through the use of mainstream television shows, comics, social stories, picture exchange systems, videos, or class discussion teaching resources, they all incorporate a strategy or intervention that is highly visual in nature and allows for easy review (Charlop & Milstein; 1989; Charlop-Christy, Carpenter, Le, LeBlanc, & Keller, 2002; DeLano, 2007; Haring, Kennedy, Adams, & Pitts-Conway, 1987; Kalyva & Agaliotis, 2009). These two common components of highly visual material and allowing for individuals to access the strategy as often as possible provided the foundation for the choice of using video modeling in particular in the current investigation.

Virtual Environments to Model Social Skills. More recently, studies exploring the use of virtual environments among individuals with ASD as a means of modeling, imitating, and eventually changing behaviour have created a new research area. The benefits of computer-based tasks for people with ASD have been highlighted in research over the last 15 years (Moore, 1998; Moore, McGrath, & Thorpe, 2000; Moore & Taylor, 2000; Wilson, Foreman, & Stanton, 1998). Current technology allows for visual and auditory input to be controlled, allowing for consistency and repetition (Parsons, Mitchell, & Leonard, 2004; see also Cromby, Standen, & Brown, 1996; Strickland, Marcus, Mesibov, & Hogan, 1996).

With the constant evolution of technology, interactive multimedia computer programs have allowed people with ASD to successfully learn about emotions and social problems (Baron-Cohen, 2010; Bernard-Opitz, Sriram, Nakhoda-Sapuan, 2001). The intervention used in this study, *Model Me Kids*, uses a similar rationale where students can independently view videos at their own leisure as often as needed. The accessibility of technology in all schools in Ontario makes using technology-delivered interventions a time-and cost-saving approach to providing individualized social skills programming to meet individual needs of students. Having the videos and instructional clips organized and easily accessible to students to view individually allows schools to support social skills development among greater numbers of students with ASD.

Perhaps the most advantageous aspect is that increasingly sophisticated virtual environments allow users to role-play in environments that are "designed to mimic specific social situations [allowing] tasks and skills [to] be practised in increasingly realistic settings" (Parsons et al., 2004, p. 450). More recently, Welch et al. (2009) explored the design and development of software to create social interaction modules to target the ability to recognize affect in children with ASD. The virtual environment was explored as a means to present realistic social communication tasks to the children and to monitor their motor empathy responses using various physiological signals (including body reactions such as change in temperature and heart-rate). Although heavily reliant on medical equipment and software development, the study points to a new and exciting research direction for the development of and reporting of effectiveness of future social skills interventions. Similarly, Cheng, Chiang, Ye, and Cheng (2010) employed 3D animated empathic scenarios through a virtual learning environment in an attempt to increase instances of empathy among

individuals on the spectrum. Results demonstrated that using a collaborative learning environment that employed such scenarios had "significant and positive effects on participant use of empathy" (Abstract).

These studies have demonstrated that simulation interventions are more practical and accessible with new technology. While findings seek to validate the potential of simulation technology programs, they reveal a lack of empirical evidence supporting the effectiveness of such programs (Laugeson, 2012). The above mentioned studies do have limitations, as they do not assess the treatment outcome, are not individualized to strengths and weaknesses of participants, and do not teach ecologically valid social skills. As a result, the skills do not generalize to other settings, which is ultimately the goal of the present study. Studies in this vein have shown that video modeling is an effective tool for employing simulation to teach complex skills (Corbett & Abdullah, 2005).

This study seeks to ultimately expand the social skills development approach by viewing empathy as not only having cognitive and emotional aspects but having the additional facet of motor empathy. The quest to further understand the complexity of social skills, and empathy in particular, is the ultimate goal of this study, seeking to increase the ability of individuals with ASD to have social relationships with those around them. Theory of mind, which was overwhelmingly inherent in the literature review, will be expanded on, as it was used as the basis for the choice of video modeling as the intervention. In the vein of Laugeson (2012), the study seeks to track the effectiveness of a specific, targeted intervention that controls the environment while allowing for practice and repetition as much as individual students may need. As Autism Ontario (2011) and similar meta-analyses have already confirmed video modeling as an evidence-based practice, this study seeks to

turn the attention to what the change in behaviour is for individual participants and to determine if there are measurable gains and what those gains look like for the targeted population (Wang & Spillane, 2009; Williams White et al., 2007). The benefit of using a consistent curriculum in teaching social skills on an individual level (as opposed to 70% of Ontario's social skills training centres which use groups as their only mode of delivery; Autism Ontario, 2011) is explored to determine whether individuals with ASD increase empathic behaviour or change their perception of empathic behaviour as the result of employing video modeling.

Chapter 3: Theoretical Framework

Defining the Construct of Empathy

Despite a seemingly endless pool, Levine (2005) provided a definition of empathy that seems to have become widely accepted: "an emotional or visceral response to another person's anxious or painful event . . . . The empathy process in its simplest form takes place when a person's emotional response translates into a caring action" (p. 17; see also Bischof-Kohler, 1991; ; Eisenberg, 2000; Eisenberg & Strayer, 1987). However, such a definition presents the complex concept of empathy as far more simple and clear than it is in the field of psychology. Hoffman (1982) argued that moral development is the outcome of an active process, involving "increased interaction with peers and exposure to levels of moral reasoning higher than one's own" (p. 90). It is these experiences that, in essence, provide the basis for the process of empathy, the ability to take the role of others and process how others would feel in a particular situation.

Hoffman (1982) further developed this aspect of empathy as a moral affect and explored the natural empathic development process that largely laid the foundation for Baron-Cohen's ToM which was overwhelmingly present in the literature review. In particular, Hoffman argued that because people can empathize "better with someone's emotion if they have experienced the emotion themselves, empathic capability should be fostered by socialization that permits children to experience many emotions rather than protects them from emotional experience" (p. 97; see also Eisenberg, 2000). Hoffman's developmental theory maintained that because empathic behaviour is often involuntary, socialization experiences should be created and highlighted that foster empathic development. Thus, developmental theory holds the view that by employing role-taking

opportunities, children will increase the chances of paying attention to others and acting empathically during peer interaction.

Studies which distinguished between moral and conventional sense have led to a deeper understanding of morality among individuals with ASD; "having moral sense means being able to distinguish between a moral violation (e.g. pulling hair) and a conventional violation (e.g. chewing gum at school)" (De Vignemont & Firth, 2007, p. 277; Smetana, 1985; Turiel, 1983). Interestingly, findings have indicated that children with ASD "were not significantly different from controls [and] were able to distinguish between moral and conventional violations, despite their impairment in theory of mind" (De Vignemont & Frith, 2007, p. 277). This study found that individuals with ASD are able to detect transgressions of rule and detect someone's distress but not necessarily relate the two things to each other. This is easily transferred to empathy among individuals with ASD—they can identify emotions in others and understand why someone would feel a certain way in a certain situation but do not necessarily see the two things together as one emotional response. In light of these studies, the construct of empathy is arguably much more complex than either emotional or cognitive empathy.

By extension, to argue that the two cannot be separated may also not holistically represent empathy when the construct is examined in relation to the field of ASD research. In fact, the construct of empathy when viewed in its complicated entirety must include the facets of emotional, cognitive, and motor empathy. Empathy cannot easily be separated into these facets; when you stop to ponder the crossover between cognitive, emotional, and motor empathy, it calls into question whether they should be viewed independently at all. Each facet is entwined in the others— for example, if a student sees another person crying

and becomes upset, it does not mean that he or she stopped and thought about that person's situation. It could mean that he or she did, but also it is a motor reaction to the tears seen or that he or she chose to respond by mimicking the behaviour rather than going to see if he or she could help. This is the rationale for the following presentation of empathy as a complex construct combining emotional, cognitive, and motor components in the current study among individuals with ASD. Although it would definitely be easier to focus on only one area of empathy when exploring ways to increase empathic behaviour, it would not provide a complete picture of the challenges one faces when the ability to show empathy is impaired, nor would it provide the necessary theoretical grounding needed to explore empathy among individuals with ASD.

The Complex Relationship between Empathy and ToM in the Field of ASD

Research. As outlined in the literature review, the basic idea behind ToM is that individuals with ToM are able to understand and predict the actions of others while those who do not have ToM cannot (Johnson et al.,2009; see also Astington, 1990, 1993; Baron-Cohen, 2001; Doherty, 2009). Many researchers have made the interpersonal process connection between empathy and ToM inextricable and explicit, arguing that understanding your own mind is pivotal to understanding the minds of others (Goldman, 1993, 1995; Hobson, 1993; see also Blair, 2005; Gillberg, 1993; Melzoff & Gopnik, 1993; Perner, 1993, 1996). Such views have developed into a discourse leaning towards the supposition that "putting oneself in someone else's shoes emotionally and cognitively seems to rest on the equivalence between self and other" (Meltzoff & Brooks, 2001, p. 189).

However, recently, theorists have argued that the accepted interchangeability of ToM and empathy is problematic, calling for an increased distinction between cognitive

empathy and emotional empathy. Cognitive empathy (the ability to take another's perspective) is inherently tied to ToM, but emotional empathy (choosing the appropriate emotional response), many argue, is not (K. Rogers et al., 2007; see also Rajendran & Mitchell, 2007). Similarly, when viewed through a pragmatic lens, the importance of an individual with ASD understanding his/her own mind is called into question. Whether an individual with ASD feels empathy is not the observable behaviour exhibited; further, empathic behaviour can be demonstrated, with motor reactions, without feeling the same way as the other person.

Learning how to act and react in certain situations by understanding the way others feel does not require feeling the same way. In the simplest terms, although individuals with ASD may not demonstrate cognitive empathy, they may learn and apply emotional empathy. Studies into facial mimicry and elevated heart rate have led to insight into the ability of individuals with ASD to show emotional empathy. These studies, in a broad sense, argue that although research has uncovered instances of observable empathic behaviour among individuals with ASD, this does not necessarily mean that the individual shares the "basic emotional experience with others" (Spink & Heinström, 2011; Welch et al., 2009). Studies in this vein support the argument that motor empathy can be a vehicle for individuals to learn emotional empathy; Bauminger and Kasari (2000) postulated that there is much more to the idea of empathy than many studies acknowledge and urged further investigation into the various intricacies of cognitive, emotional, and motor facets of empathy. Understanding the emotional aspect of empathy involves much more than only cognitive empathy. This study incorporated a mixed methods design to allow for data to be collected for both

involuntary motor reactions but also observation to provide insight into what is happening in the mind of an individual with ASD when he or she behaves in a certain manner.

This complicated relationship between theory of mind and empathy can be clearly understood through the lens of what Reindal (2008) has deemed as a "necessary and sufficient distinction" (pp. 143–144). Basically, a *necessary condition* is defined as a prerequisite: in this case one must have ToM to be able to feel and act empathically. However, ToM is not always a *sufficient condition* because it is possible to have ToM but not act or feel empathic towards others. Thus, having knowledge of the mental states of others does not guarantee one will employ that knowledge in order to act in an empathic manner. The complexities of the relationship described above are inherent in my defined construct of empathy (which includes cognitive, emotional, and motor components), the methodology collecting quantitative and qualitative data of instances of learned responses that are parallel (mimicking) and reactive (learned) outcomes of empathic behaviour, and the resulting research questions. Davis (1994) outlined two outcomes of emotional empathy: parallel outcomes in which empathy manifests as mimicking behaviour and reactive outcomes where the empathic reaction is most appropriate to the situation. These two factors were components of the qualitative observation log, and the goal was to observe reactions and develop trends for when instances of empathic behaviour were exhibited.

In order to further explore the usefulness of employing simulation theory (ST) to teach empathy, an attempt has been made to synthesize ToM with the benefits of modeling strategies (Appendix A.1; see also Appendix D.3**)**. Although most studies explore empathy from a cognitive or an emotional theoretical standpoint, this study focused on the interplay between emotional, cognitive, and motor empathy as outlined above. Individuals with ASD

lack natural empathic behaviour, and for that reason the current study examines an intervention to foster appropriate reactions in situations requiring empathy and gathers observation and self-rating data to determine the effectives of the intervention.

Simulation Theory as a Means to Explore Empathy among Individuals with ASD. The exponential growth of theory of mind (ToM) in the last few decades has led many prominent theorists to argue that ToM "almost dominates the whole field of cognitive development; publications dealing with [ToM] development now number in the hundreds, and the flow shows no signs of diminishing" (Flavell, 1999, p. 23). Since its conception, ToM has profoundly impacted research in the field of ASD by creating a bridge between research and everyday practice. Since psychologists Premack and Woodruff 's (1978) early exploration of mental state interpretation with chimpanzees, many theories have highlighted the importance of understanding belief, emotion, desire, and intentionality in ToM. In order to explain thought or action it is believed that individuals characterize themselves and others in mental terms. In the popular pursuit of conceptualizing how children come to understand the mental states of themselves and others, a plethora of theories have been proposed. Collectively, ToM researchers have explored children's ability to predict, explain, and manipulate behaviour by employing various versions of Daniel Dennett's original false belief tasks to make inferences about natural behaviour (Dennett, 1978; see also Astington, 1990, 1993; Baron-Cohen, 1995, 2001; Doherty, 2009; Hobson, 1993; Perner, 1990, 1993). Such tasks require that children attribute false beliefs to answer questions in order to demonstrate understanding of the mental states of others.

In particular, three approaches have dominated ToM discourse: theory-theory, modularity theory, and simulation theory (Carruthers & Smith, 1996; Flavell, 1999; Flavell,

Green, & Flavell, 2000; Flavell & Miller 1998; Gopnik & Wellman, 1994; Hirshfield & Gelman, 1994). In order to situate the choice to ground the current study in simulation theory, a brief presentation of the various theories of mind is warranted. Many theorists have argued that each of these theories indeed offers a unique explanation of the development of understanding mental states in the preschool-aged child but do not seek to explain its origin. Despite the common view that all three approaches are in contrast to Piagetian theory, theory-theory can be viewed as having a foundational Piagetian undertone. In contrast, modularity theory and simulation theory apply the specificity hypothesis of cognitive development to different degrees which maintains that development progresses in categorical ways in different learning areas (Gelman & Wellman, 1992).

As a result, many approaches involve an inherent capacity of memorization necessary in ToM tasks and understanding. The connection between the maturation of executive functions that are necessary in the evaluation of mental states and the acquisition of knowledge of the mind seems implicit in each of the three approaches subsequently discussed (Bideaud, 1993; Carlson & Moses, 2001, p. 1049; Frye, Zelazo, & Palfai, 1995; Ozonoff et al., 1991). Although the following discussion presents these approaches holistically, it must be noted that within each there is a range of theories that are beyond the scope of the present purpose. In addition, there can often be tremendous crossover between the approaches and, thus, various theoretical frameworks have presented the approaches in different ways. For example, some theorists propose that both modularity and simulation theory are simply more specific versions of theory-theory.

Theory-Theory (TT)

Theory-theory (TT) postulates that individuals employ theoretical concepts in mental state attribution to predict action and thought. In doing so, humans apply what is often referred to as folk-psychology or "commonsense mentalism" (Wellman, 1990, p. 2). TT posits that one infers the mental states of others through observations of events and behaviour. As a result, a relationship is established between mental concepts and theoretical generalizations through causal inferences (Goldman, 1993, 2000; Lewis, 1972). In TT the main question is not "how does the child *engage* in these processes, but how does the child *conceive* of these processes" (Wellman, 1985, p. 201). The prominent role experience plays in TT development in children is demonstrated through a first-person point of view. This point of view maintains that a child's understanding of others' mental states is contingent on the prior development of a framework for understanding his or her own mental states.

In keeping with Piaget's model of development where children pass through ordered stages when they reason and think differently, theory theorists have argued that one's knowledge about the mind is comprised of an informal framework theory (Piaget, 1933, p. 219; see also Churchland, 1988; Gelman & Wellman,1992; Gopnik, 1993; Perner, 1993; Wellman, 1993, 1998). Consequently, TT theorists have emphasized the relationship between desire and belief by developing a series of stages which one moves through (desire psychology, desire-belief psychology, and adult belief-desire psychology) with age (Gopnik & Wellman, 1994; Wellman, 1990).

Modularity Theory (MT)

In contrast, modularity theory (MT) predicates that mentalizing abilities are not developed through experience but are embedded in innate, abstract mental capabilities with which humans are born. Despite the fact that main proponents of MT differ dramatically in

their explanations of module functioning, the unifying belief is that ToM is part of an innate mental module that matures through development (Fodor, 1992; Leslie, 1994a, 1994b). The main assumption of MT is that within these innate human faculties "there is a small set of primitive informational relations available early on, among them believe and pretend" (Leslie, 1994a, p. 218).

Collectively, all MT proposes neurological maturation as the main cause of developing knowledge about the mental states of others. Leslie's (1994a, 1994b) hypothesis that several different modules exist and align sequentially in children's development of ToM in the first 3 years of life has played a major role in later research. Subsequently, MT proponents argue that although experience may trigger the operation of these mechanisms, experience does not determine their nature (Flavell, 2000, p. 18). There are countless MTs proposing different innate and early maturing modular mechanisms, including the area of domain specificity theory, that increasingly use neuroscience technology to explore brain functions (Baron-Cohen, 1995; Fodor, 1992; Klin, 2008; Klin, Volkmar, & Sparrow, 1992).

Simulation Theory (ST)

The conceptual and methodological framework for the current study (Appendix A.1) was strongly influenced by simulation theory (ST) which postulates that the simulation process of pretending to be in another person's position and generating thoughts or actions attributed to the other through introspection can lead to applying complex social skills in naturally occurring settings. The relationship between motor empathy and ST is that motor empathy, in essence, is the physical response to the emotions of another person (often through mimicry). As discussed above, these responses have been noted among individuals with ASD in many studies. Simulation theory would, by extension, build on instances of

motor empathy through practice and repetition in an attempt to find methods to increase instances of empathy (and its emotional, cognitive, and motor components) in social situations.

Simulation theory is the most recent of the three approaches and, as a result, many argue it has a "long way to go in establishing research authority" (Freeman, 1995, p. 84). The main principle of ST is that one uses his or her own cognitive resources to attribute mental states. ST ascertains that children develop the ability to compute the mental states of others through role-taking or simulation processes. In particular, a fundamental belief of ST is that the key to understanding mental states lies in the powers of imagination, play, and pretend that children possess (Freeman, 1995; Heal, 1998).

The simulation process occurs by pretending to be in another person's position and generating thoughts or actions attributed to the other through introspection. Harris (1992; see also Gordon, 1995, p. 55; Heal, 1995) provided a series of steps to explain the stages of simulation including echoing, pretending, attributing intention, and imagining. Goldman (2001) highlighted the important role played by echoing and pretending: At "the heart of this procedure is that the attributor tries to *reproduce* or *match* what transpires in the target" (p. 217). Like TT, ST assumes that experience plays a formative role because, through practice and social interactions, mentalizing abilities are improved in children (Gordon, 1995, 1996; Harris, 1992; Heal, 1995). There is a shift from questioning if "the child develop[s] a theory of the mind [to questioning if the child] develop[s] the ability to imagine what it is like to be in another person's shoes" (Davies & Stone, 1995, p. 6). As a result of the belief that one's ability to imagine and simulate develops, ST holds that a first-person point of view is

essential to understanding mental states (asking "is this what I would do" type of questions about someone else's behaviour).

ST may prove an indispensable tool for developing mentalizing processes including predicting a person's thoughts and actions, making judgements of the thoughts of others, and forming views based on observation of the actions of others. Difficulty arises for individuals with ASD because mental states are not directly observable but are used to predict behaviour about others (Baron-Cohen, Tager-Flusberg, & Cohen, 1993; Blair, 1996). The facet of transferability of empathic behaviour is paramount for individuals with ASD because they face immense challenges in comprehending the minds of others. Studies have shown that individuals with ASD are able to respond through motor empathy, so the employment of ST framework for drawing attention to the emotions of others may prove a useful tool to increase empathy in the larger sense. The use of modeling and simulation strategies, over time, may prove effective for increasing understanding of the mental states of others (Peeters, 1997). It is precisely in this aspect that ST creates an avenue to facilitate learning how to understand mental states of others and practice transferring that learning to social situations. Empathy has been shown to motivate people to respond with care which, in turn, improves social behaviours. The increased use of simulation theory to build the capacity for empathy may lead to individuals who are better equipped to identify and react to the emotional plights of others, thus leading to increased peer acceptance (Fabes et al., 1994; Hastings et al., 2000; Izard, Fine, Schultz, Mostow, & Ackerman, 2001; Litvack-Miller, McDougall, & Romney, 1997).

With the distinction made in the relationship between ToM and empathy, the simulation process can provide the skills individuals with ASD may lack: the ability to

master psychological concepts which is based on one's ability to simulate others (Fuller, 1995). Research suggests that there are two kinds of attitudes through which people can see the world: egocentric ("you") and allocentric ("he/she/they"). It truly makes a difference which stance one takes; when people adopt an egocentric stance they understand the other person in relation to themselves—"what the other feels, thinks or does is relevant for the self" (De Vignemont & Frith, 2007, p. 279; Rao, Beidel, & Murray, 2008). On the other hand, when one adopts an allocentric stance, it is detached from interactions with people. Numerous studies have shown that individuals with ASD "display extreme egocentrism, disconnected from allocentrism. Their social world is self-focused . . . People with ASD do not provide any description of how people do behave, but rather how people *should* behave" (De Vignemont & Frith, 2007, p. 280). However, finding a way to shift this egocentric view to an allocentric view is the missing piece in studies that have employed ToM. ST may be a way to teach empathy and thus change the worldview of individuals with ASD. Simulation interventions are increasing in ASD educational research because, as children become older, prosocial responses become more complex. Individuals with ASD may not learn these behaviours solely through childhood observation, and findings are suggesting that practice does, in fact, lead to improvement (Golan & Baron-Cohen, 2006; Ozonoff & Miller, 1995; Robinson, 2008; Wang & Spillane, 2009;).

Temple Grandin (2006) reflected that she has a "process of using my intellect and logical decision making for every social decision. Emotion doesn't guide my decision; it is pure computing" (p. 103). Grandin's experience draws attention to the need for a logical and methodic way to teach social decisions and empathic behaviour to individuals on the spectrum. At a recent talk entitled "Empathizing and Systemizing in Autism Spectrum

Conditions," Baron-Cohen presented an approach that supports ST by defining ASD as "below average empathy alongside above average systemizing" (2010). Systematizing is defined as the drive to analyze and build a system; these common high levels of systematizing among individuals with ASD are the result of good memory and attention to detail but make it impossible to live without concrete rule-based systems (Baron-Cohen, 2006).

By employing simulation theory of mind as the theoretical backbone of this study, the high levels of systematizing among individuals with ASD is drawn upon in administering a modeling intervention to foster empathic behaviour. Other researchers such as Laugeson (2012) have further developed this theory, arguing that because individuals with ASD are visual learners, using interventions that capitalize on this modality are the most logical (although there are very few to no studies to date that focus on that). By modeling social skills that teenagers would actually do, a process Laugeson deems "ecologically valid," rather than what an adult would do is a novel and important shift in social skills programs. This is in line with Bandura's (1977) argument that the most effective peers are those closest to attributes and abilities of the observer; this argument makes the modeling intervention explored*, Model Me Kids*, a valuable tool, as the "models" featured are adolescents on the spectrum in similar situations.

Modeling Interventions. The effectiveness of modeling in particular among children with ASD has been confirmed as a valid intervention in many studies. Video modeling is presented as effective in many different areas to teach language, play, social behaviour, and adaptive skills. Temple Grandin (2006) makes a similar argument in *Thinking in Pictures* when she says that:

words are like a second language to me. I translate both spoken and written words into full-color movies, complete with sound, which run like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures." (p. 1)

The monumental argument to be made in favour of video modeling is that the "methodology appears particularly efficacious for children with autism" (Corbett & Abdullah, 2005, p. 1). This idea builds upon Bandura's (1986) framework of observational learning, which presented four distinct processes that facilitate this type of learning: attentional, retentional, production, and motivational. The attentional process is the initial act of vicarious acquisition that occurs when an individual accurately perceives a model. The attentional process requires the intake of sensory stimuli and focuses on the specific task. The retentional process requires the learner's capacity to process the behaviour that is modeled. Finally, retention occurs when modeled behaviours are coded internally into meaning and then stored in memory. The chances of meaning being made and transferred into memory are increased with the use of visuals, rehearsal, and role play (Corbett & Abdullah, 2005).

The production process occurs only when the learner accurately reproduces and rehearses the behaviour that has been modeled through action. The final stage is the motivational process, which is when reinforcement is used and eventually faded out once the desired outcome is the result of the behaviour itself. The reason video modeling is effective with children with ASD is because it is highly visual, forces a restricted field of focus, and also avoids face-to-face attention. Basically, as part of using video modeling, before the student actually encounters anticipated situations, time is spent previewing and practicing. Through video modeling, the student is able to preview circumstances so that they become familiar and predicable. In a sense, a safe haven is created while learning the skill because

the student does not have to actually interact socially during the learning process. Further, video modeling format taps into the visual presentation that works among students with ASD (DeLano, 2007).

Applied Behaviour Analysis (ABA) has been proven as an effective method for working with students with ASD. Recently all Ontario school boards implemented policy (PPM 140) that makes all teachers accountable for learning and applying ABA (see Appendices A.3 and A.4 for additional information). Beyond being a required approach in working with students on the spectrum, ABA has informed the current study, as my experiences with students have proven success in challenging difficult behaviours in class by implementing the strategy. Simply speaking, ABA is a systematic approach to change behaviour by either decreasing undesirable skills or increasing desirable skills. ABA is based on common features and strategies proven to work with students with special needs that enhance predictability, provide structure and routine, increase motivation, and ensure generalization of skills (Geneva Centre for Autism, 2007; Perry & Condillac, 2003). Indeed, it has been proven that "individuals with autism often benefit from visually cued instruction and show strengths in processing visual rather than verbal information" (p. 4). In addition to building on the principles of ABA and thereby using a tool for teaching behaviour that educators already implement regularly, video modeling offers a novel method to learn through social models without initial face-to face interactions.

It is revealing that most studies noted above have only scratched the surface of exploring effectiveness of social skills training interventions and have largely targeted very young, high functioning children (typically with Aspergers syndrome). Laugeson, Frankel, Mogil, and Dillon (2009) called researchers to change focus because so "few social skills

interventions have been devoted to investigating the efficacy of social skills training for teens that are less socially impaired, such as teens with Asperger's [syndrome] or high functioning autism" (597). The implication here is that most high functioning individuals with ASD tend to be highly aware of the difficulties they encounter when interacting with peers (Tse, Strulovitch, Tahalakis, Meng, & Fombonne, 2007). Marks, Schrader, and Longaker (2000) presented three telling portraits of three adolescent students with Asperger's syndrome. Thomas's particular story encapsulated just how important social skills are to all teenage students, even those who struggle to learn and apply them. His mother observed that when he entered his teen years Thomas:

> "Really realized that he has a hard time knowing how to socialize, and he said that he felt bad that other kids seemed to know how to talk to kids and know how to talk to girls, and he just didn't know how to do it." (p. 13)

This study seeks to go beyond the surface studies outlined here and explore the complexity of empathic behaviour among individuals with ASD. This study, in exploring motor, cognitive, and emotional components of empathy as one construct grounded in theory of mind, seeks to determine whether or not a video modeling intervention as a teaching strategy to simulate social situations is effective in changing behaviour. The intervention was chosen as it aligns with the strengths of individuals with ASD as visual learners with strong systematizing abilities and the foundations of ABA which drives programming in Ontario for this group of learners. This mixed methods study seeks to explore the impact of video-modeling intervention on specific empathy behaviour with peers. The structured practice, inherent simulation process, and visual learning components are explored to determine the impact on displays of empathic behaviours. Self-perception

and observations are examined within the intervention. The goal was to expand knowledge of complex empathic social skills and explore the relationship between theory of mind and process of simulation. The rationale for the choice of the video intervention was to provide insight into the social realities of individuals on the spectrum interacting with peers.

Research Questions

The main research question for this study is: (a) What impact does the implementation of an empathy-focused video modeling intervention have on frequency of empathic behaviour among adolescents with ASD? The secondary research questions are as follows: (b) In what ways does employing a video modeling simulation intervention using the *Model Me Kids Friendship* program enhance the ability of adolescents with ASD to demonstrate empathic behaviour?, (c) How do adolescents with ASD express or speak about their empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship*?, and (d) How do the assistants perceive the same individuals' empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship (MMF)*?

Chapter 4: Methodological Framework

Mixed Methods Design

The research questions outlined above required a mixed methods approach to gather the appropriate data and facilitate discussion. This chapter explores the mixed methods design, participants, context, and procedures of the study. In addition, a critique of the instrumentation and analysis paths are explored to provide context for the subsequent findings and discussion chapters.

To answer the research questions, defining and then choosing appropriate methodology is the logical first step. The research questions around the perceptions of the participants as well as the ERFs who work with them lends itself to both quantitative and qualitative data collection and analysis. Similarly, the first two questions, which explore the impact and ability to demonstrate empathic behaviour following the video intervention, required both qualitative and quantitative data. In order to ensure that the participants' individual social interactions and perceptions were factored into the analysis, a qualitative facet was necessary as well. The rationale for the use of mixed methods research was that the model allows for a researcher to be his or her "own methodologist" outside the historically prescribed boundaries (Andrews, 2008, p. 172; see also Creswell, Plano Clark, Gutmann, & Hanson, 2003; Ercikan & Roth, 2006; Greene & Caracelli, 2003; Greene, Caracelli, & Graham, 1989; Hammersley, 1989; R.B. Johnson, Onwuegbuzie, & Turner, 2007; Maxcy, 2003; Morgan, 2007; Morse, 2003; Rocco et al., 2003; Siegel, 2006; St. Pierre, 2006; Wright Mills, 1959). Simply speaking, the multiplicity encouraged by mixed methods provided the opportunity to explore the social realities of individuals with ASD from a more complex angle (Teddlie & Tashakkori, 2003).

R.B. Johnson et al. (2007) cited more specific reasons for combining quantitative and qualitative research including the use of one method to confirm or corroborate the findings of another, a process called triangulation. Triangulation involves the combination of various data sources to study one social phenomenon. In the current mixed methods research project, triangulation was used to validate research findings— the qualitative insights enhanced quantitative findings (Denzin & Lincoln, 2005, 2008a, 2008b). The inductive nature of mixed methods inquiry can allow for insights that may be missed when only a single method is used, and in the case of the current study mixed methods allowed not only for change in behaviour to be noted but also for participants and observers to examine perceptions of empathy as well.

The observation log allowed for qualitative data to be collected that may give a glimpse into the type of attitude of individual participants— do they see the world through an egocentric lens or allocentric lens? Although most individuals with ASD typically view the world through an allocentric view, this study sought to examine whether that attitude is subject to change (Fuller, 1995; Begeer, Burnstein, van Wijhe, Scheeren, & Koot, 2012; De Vignemont & Frith, 2007; Lee, Walter, & Cleary, 2012; Rao et al., 2008). The qualitative log was designed to collect data as to whether or not the structured video simulation provided a foundation for potentially shifting an egocentric view to an allocentric view and providing further opportunities for social skill refinement

Mixed methods studies often include a variety of research questions, including both open- and closed-ended questions in addition to multiple forms of data. In this study the research questions (a) What impact does the implementation of an empathy-focused video modeling intervention have on displays of empathic behaviour among adolescents with

ASD?) and (b) In what ways does employing a video modeling simulation intervention using the *Model Me Kids Friendship* program enhance the ability of adolescents with ASD to demonstrate empathic behaviour*?* were informed by qualitative observation data. However, the two remaining research questions: (c) How do adolescents with ASD express or speak about their empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship*? and (d) How do the assistants perceive the same individuals' empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship (MMF)*? were explored through the quantitative and qualitative results.

This diversity of data forms allowed for a wealth of data to be generated in the single study and provided a platform for an examination of empathic behaviour with all of the inherent complexity (rather than simply reducing complex individuals to statistics). Ultimately, mixed methods allowed for multiple perspectives to be gathered (student, teacher, and teaching assistant). The multiple perspectives resulted in more diverse data which, in turn, ideally leads to results that provide a richer snapshot of empathic behaviour among individuals with ASD through the use of self-ratings as well as staff ratings.

This study used a randomized controlled experimental research design whereby two randomly assigned groups of participants were observed over time (Brady & O'Reilly, 2009; Creswell, 2003). The reason for this choice was to evaluate the effect of the *MMF* program on empathic behaviour**.** It is only by having a range of intellectual impairment as well as all having confirmed autism diagnosis (there were no cases of individuals with Asperger's syndrome in the program). Creswell and Plano Clark (2010) suggested four variations of mixed research design, and an embedded design was carefully chosen using the decision tree

framework proposed by Creswell and Plano Clark (Appendix A.2). In an embedded design, one data set provides a secondary support in a study that is based primarily on the other data type; thus, one type of data is embedded in a methodology that is framed by the other type. Initially it was presumed that the quantitative data would drive the analysis in terms of the impact of the empathy-focused video modeling intervention. However, the qualitative data collected turned out to support a stronger impact and allowed for richer discussion in light of insufficient finite change.

The reason for gathering data to support both the student's and the educational research facilitators' (ERFs) perceptions of empathy was to provide insight into the complexity of empathic behaviour. Students may not necessarily show empathic behaviour but still may perceive themselves as showing empathy in social situations. In the findings, the student perceptions were equally as important as the adult observers' perceptions of their empathic behaviour, as both perceptions brought insight into answering the research questions around the frequency and importance of such behaviour. Prior to analyzing data, it was not known what the perceptions would be or whether any patterns would emerge, so both were accepted as equal.

The ERF observers were able to measure frequency and record context of situations involving empathy and thus voice their perceptions about the students' empathic behaviour. As there is a social unawareness common among individuals with ASD, these data were of utmost importance, as ERFs could observe social situations and context that students may not have reacted to. However, student perceptions of their own behaviour provide a firsthand view of why they act the way they do in certain situations. Also, students may feel different than they act and only they would have that information about their empathic behaviour, as

internal motivation cannot be observed. In the discussion section the data gathered from both groups were weighed and analyzed as being of the same importance, each providing a unique insight and perspective.

Moreover, qualitative data were used to answer the question surrounding how individual participants' behaviour changed in natural settings as a result of the modeling intervention. These data provided insight into the types of emotional contexts that drove instances of empathic behaviour during the study. The structured log provided the details necessary to later analyze the situational contexts of individual participants' empathic behaviour (Appendix E.1).

Participants

Demographics. The research project was conducted with a targeted group of adolescents (aged 13–19) who are currently enrolled in a regional ASD program at a single high school with a dual diagnosis of ASD and either mild intellectual disability (MID), language impairment (LI), or learning disability (LD). ASDs are not diagnosed based on the existence of one factor or symptom but when a combination of the specific behaviours, communication delays, and/or developmental disabilities are confirmed through a series of screening tools by a physician in consultation with a child psychologist (the most common is the *Diagnostic and Statistical Manual of Mental Disorders*, *Fourth Edition* DSM-IV which is used by the participating school board psychology staff). MID, LI, and LD diagnoses are determined by educational psychologists through testing, observation, and consultation with the student, parents, and teachers and results in the writing of recommendations (included in the Individual Education Plan) to meet specific educational programming needs and provide accommodations and modifications to enhance student learning. Dual diagnosis is confirmed

through a formal Identification, Placement, and Review Committee as outlined in special education policy prior to student acceptance into this specific regional program (Appendix A.5).

Context. This site is the largest of approximately 10 integrated secondary ASD programs in the central Ontario board, currently with 54 students enrolled (52 males, 2 females). The male-dominated demographic of this group is typical in the context of ASD and MID/LI/LD in North American special education where the male to female ratios are 5:1 and 3:1 respectively (National Research Center on Learning Disabilities, 2010; see also Balasubramanian, Bhatt, & Goyel, 2009; Caplan, 1977). The students in the program are either in diploma-stream programming (at the applied or modified level) or in certificate-stream programming (academic work is at the primary level so students earn partial credits but do not finish high school with a diploma). These levels are determined by the intellectual functioning levels of the participants, and the programming expectations between diploma-stream and certificate-stream vary greatly (the certificate-stream is modified to approximately a grade 3 level in all subjects). Table 1 presents a summary chart for participants in each of the groups, with age, diagnosis, and intellectual functioning descriptors. As assessments do not occur for all students at the same time or by the same psychologists, students had varying tests administered in the past. Although not all results were based on the same assessments, the board psychologists interpret findings and enter a summary with the common descriptors of overall intellectual functioning as very below average, below average, low average to below average, average, and above average. Those statements were included in this snapshot of participant descriptors.

All students in the program were invited to participate as a member of either the control group or treatment group through the recruitment pamphlet and a session where we read through the information together. Although I have worked in the school in the past in various capacities and have years of experience with special education students, I have never taught any of the students enrolled in this particular program, nor have I taught in the regional program. As a teacher from outside the program, recruitment was pressure free so students and parents felt more at ease to choose whether to participate or not. Even in the case of students who were 18, the expectation was set that both student assent and parental consent were needed because these individuals may not be fully informed (see Appendices B.1–B.4 for parent and student consent

forms and recruitment texts).

The intervention and control groups were formed from the 30 student volunteers randomly using computer randomization (Excel using formula = RAND). Although random, the groups were checked quickly for a balance of students in the diploma and certificate streams, as having either one dominant in either the intervention or control group would influence findings. However, the randomized selection had divided them up almost equally. Randomized selection eliminated researcher bias and increased the chances of treatment type remaining blind to ERFs during the 3-month investigation period. It was important that students be randomly assigned and ERFs be blind to which students were watching the intervention videos to build validity in ratings of student behaviour and ensure that the observation logs were not influenced by any preconceived notion of which groups the students were in.

Table 1

Study Participants

Participant # or anonymous name	Age	Identification	General ability index summary- Diagnosis
		Control group	
1	19.1	Autism	Below average to low average-LD
2	13.8	Autism	Below average to low average-LI
3	15.4	Autism	Very below average (the 1st percentile)-MID
4	17.8	Autism	Low average-LD
5	15.6	Autism	Very below average- 1%ile-MID
6	16.8	Autism	Below average-LI
7	18.0	Autism	Very below average-MID
8	14.8	Autism	Very below average-MID
9	17.9	Autism	Very below average-MID
10	14.1	Autism	Below average to low average-LD
11	17.5	Autism	Below average to low average-LD
12	16.7	Autism	Below average to low average-LI
13	18.3	Autism	Low average-LD
14	17.1	Autism	Very below average-MID
15	15.8	Autism	Below average-LI
16	17.1	Autism	Below average-LI
17	14.7	Autism	Very below average-MID
18	13.9	Autism	Below average to low average-LD
19	14.3	Autism	Below average to low average -LD
20	16.5	Autism	Very below average-MID
		Intervention group	
Harry	17.2	Autism	Very below average-MID
Deborah	16.3	Autism	Low average to below average-LD
Jennifer	13.8	Autism	Low average to below average-LD
Terry	16.8	Autism	Very below average-MID
Aaron	18.5	Autism	Below average-LI
Richard	13.8	Autism	Very below average- below the 1%ile-MID
Jeffrey	15.1	Autism	Very below average-MID
Shawn	14.3	Autism	Low average-LD
Herald	19.0	Autism	Below average-LI
Robby	14.8	Autism	Very below average-LI

Note: Students in the intervention group were given pseudonyms for the purpose of discussion in the qualitative section.

Procedures

Initially, the projected number of participants was 30–40 students and 15 ERFs in this study as this group of students has very particular needs that pose challenges to a larger sample size. In the end, there were 30 student participants and 14 ERFs who volunteered to participate. Within the 30 student group, there were 14 students from the diploma stream and 16 students from the certificate stream. The ERFs each tracked up to one or two students, which matches the program support model where each ERF travels with a small cluster of students throughout the day. ERFs were consulted regarding the project, but the extent of ERF participation was ultimately dictated by the students who chose to participate. All participating students in the program completed the preintervention and postintervention ratings, but the targeted empathy video intervention *(MMF)* was introduced only to the randomized treatment group (less than half of the participants, $n = 10$) while the control group ($n = 20$) were watching alternative videos from the *MMK* program. There were a variety of factors why a number of students did not participate (lack of consent, basic communication skills, or attendance which limited the targeted number of participants but also eliminated a few from the intervention group due to poor attendance, or lack of integration in classes during the course of the study).

The small size of the sample, $N = 30$, is justified in the context of the participant population, there are many studies that conduct statistical analysis with small populations of individuals with ASD. Studies in a similar vein to this study typically have well under 40 participants, with some as few as eight (Bellini, 2004; Carrola, 2006; Cunningham, 2009; Laugeson et al., 2009; Monahan, 2000; Reeve, 2001; Slavin, 2009). Additional justification for the sample size is that the embedded mixed methods research design proposed and

following analysis techniques have been deemed appropriate for smaller sample sizes; Onwuegbuzie and Collins (2007) cite 20 participants as acceptable in experimental research designs.

The small sample size of 30 was sufficient to address the research questions, as the study was not looking for a probability sample with a large number of cases. The study was designed to isolate a small, manageable number of cases that would yield the most information about the complex phenomenon of empathy among adolescents with ASD. The nature of the students and the intensive support by the program staff involved justified the small population size. Thus, the purposive sampling technique was employed in which participants were selected specifically for the information they possess (Teddlie & Tashakkori, 2003). It was the intention that by using random sampling, each sample unit in the clearly defined ASD population would have an equal chance of being included in the intervention sample should they agree to participate. This allowed for results that could be "generalized" from the sample to a larger population of adolescents with ASD within a computable margin of error. However, although it is possible that the participants may have formed a sample that is not representative of the population in the program, that did not occur in this case.

This project had an element of participant collaboration among the ASD lead teacher, principal researcher, and the participating ERFs (See Appendices B.5 and B.6 for consent form and recruitment text) who helped collect observational data. This information was handed out to ERFs for them to look through at their leisure and return consent forms if they were willing to participate. The lead teacher in the program runs the "home base" where students return throughout the day for individual instruction, assistance, a break, or a

quiet workspace when integration becomes overwhelming. This teacher is in charge of determining the type of programming needed for individual students and communicating with classroom teachers and parents. The ERFs have a more specialized role as they integrate with particular assigned students to their classes and assist in both academic and social situations throughout the day.

The intervention explored in this study involved showing seven clips from *Model Me Friendship (MMF),* an existing video-based program, which has been utilized by parents and educators as a means to increase social skills among adolescents with ASD. *MMF* is part of a larger program called *Model Me Kids (MMK)*. *MMK* was founded in 2004 by Susan Klein who noted during her time working with children and teens with ASD that there was a gap in social skills training curriculum. As a result, she created *MMK*, which consists of social skills training through video, worksheets, lessons, and curriculum. The *MMK* development team consisted of speech and language therapists, psychologists, and experts in sensory and communicative impairments who are dedicated to producing affordable teaching tools for individuals with ASD (Klein, 2004). The theoretical backbone of the program, though not explicitly stated, appears to be simulation theory, as the videos model social situations and allow for imitation and repetition to meet the individual needs of participants. The system was designed for all those who educate, raise, or live with individuals with ASD. Despite its growing popularity and widespread use, research exploring the outcomes of using this particular program are lacking at this time.

The *MMF* component of *MMK is* a 75-minute disk with individual clips under 3 minutes in length. The *MMF* program features videos with narration by teens with ASD (See Appendix C.1 for pertinent clips targeting empathy). It is important to note that the videos

themselves are set up didactically with guided instruction, structured lessons, concrete rules outlining steps of social etiquette in peer interactions, and role-play scenarios depicting successful and unsuccessful examples of empathic social interactions. The intervention itself was chosen as it is ecologically and socially valid; the teens featured in the videos are not only in situations that are naturally occurring in secondary schools but are also actors with ASD. Choosing an intervention that was socially valid was of vital importance in the initial phases of planning and forming the questions in order to find an intervention that would allow social learning to generalize to new situations and thus be in keeping with the fundamentals of ABA (Bandura, 1977; Baron-Cohen, 2006; 2010; Geneva Center for Autism, 2007; Laugeson et al., 2009). Social validity represents a useful way of conceptualizing social competence and in this case the particular social skill of empathy (Laugeson, 2012). A "social validity conceptualization defines social skills as socially significant behaviours exhibited in specific situations that predict important social outcomes for children" (Gresham, Sugai, & Horner, 2001, p. 333). Other more prevalent interventions, such as social stories, power cards, or the PEERS program, were not chosen as they do not have a video/visual component or include the use of multimedia which engages teen learners (Laugeson, 2009).

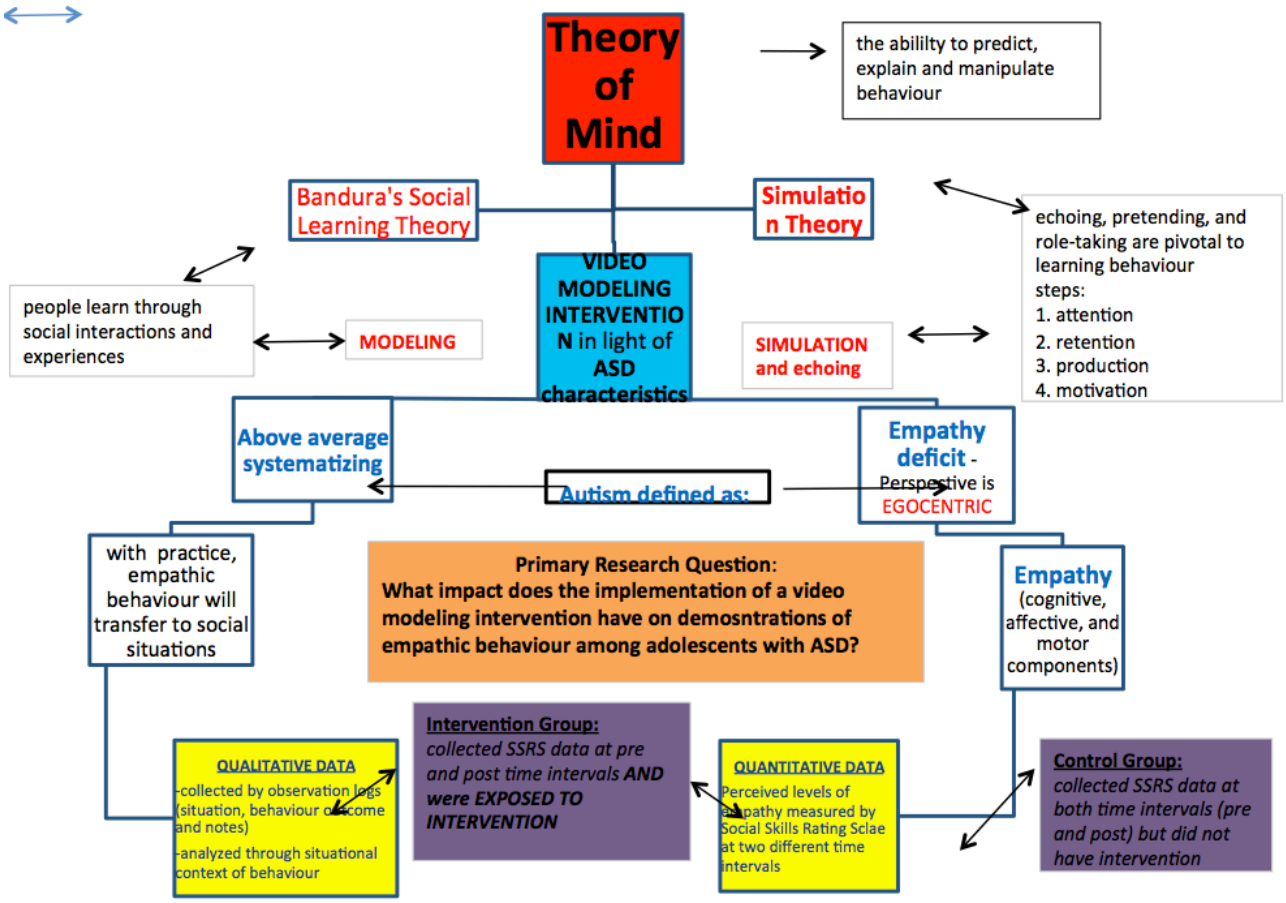
The intervention group watched the *MMF* videos over the course of each week; it worked as a cyclical intervention (they watched at least one video per day and some of them watched a particular video of interest a number of times/days in a row). The control group watched an alternative video collection—*Model Me Tricks and Tips*—which focuses on building skills of voice modulation, good hygiene, and work habits for the same amount of time each day and week. As a result, all participating students completed the same

preintervention and postintervention surveys, had ERFs rate their behaviour, and were watching videos at the same times. The only thing that differed was the content of the videos that were introduced.

All participating students watched the videos as part of their one-to-one daily support in the ASD home base classroom and general learning strategies course; as discussed in the literature review there has been more success in individualized interventions that happen outside of integrated environments (Bandura, 1977; DiSalvo & Oswald, 2002). It is for this reason that the intervention was implemented during their time within the regional program and not when students were integrated into mainstream classes. For a quick reference of overall theoretical methodological framework, the figure on the following page highlights key theories and methods and shows the relationship between theory of mind, simulation theory, and empathic behaviour in exploring the research questions.

The intervention group was observed by their ERFs for behaviour in situations involving empathy from September 2011 until the end of December 2011. Although the observation log was employed throughout the 3-month study to record instances of participant empathic behaviour, the ERFs were blind as to whether students were receiving the intervention (*MMF)* or the placebo *(MMK)*. This was done by the researcher with the assistance of the technology support person in the school who installed the corresponding group of videos as an icon for each student's private login screen. This allowed participating students to log on to any computer in the school and have access to the videos for their randomly assigned group (Appendix C.2 for alignment of research questions with data sources and study timeframe).

Figure 1



Theoretical and Methodological Framework

Quantitative Instrumentation. The Social Skills Rating Scale (SSRS) was chosen as a main component of quantitative data collection for this study as a vehicle for determining whether participants ultimately acted more empathically after the focused intervention of the *MMF* videos. The SSRS is a standardized, norm-referenced questionnaire designed to classify social behaviour for individuals aged 3–18 (the adolescent/teen version was used in this study). It is based on a sample of 4,000 children and contains gendered and ability norms. A testament to the concurrent validity is that there are moderate to high correlations of 0.83–0.94 between SSRS and other measures of social competencies (Gresham & Elliot, 1990; for recent studies of content validity of the instrument see also Rich, Shepherd, & Nangle, 2008; Van Horn, Atkins-Burnett, Karlin, Ramey, & Snyder, 2007). The SSRS has demonstrated high levels of reliability and content validity in clinical trials, has been updated over the years, and continues to be used by psychologists in schools nearly 2 decades after its creation.

The development of items was based on children's social behaviours and empirical research which also supports high internal consistency and construct validity (Bain & Peiletier, 1999; Byrne, Bawden, DeWolfe, & Beattie, 1998; Diperna & Volpe, 2005; Monahan, 2003; VonBrock Treuting & Elliott, 1997). This SSRS tool has also been used in many previous studies examining the social skills of individuals with ASD (Bellini, 2004; Koning & Magill-Evans, 2001a; Ozonoff & Miller, 1995; Slavin, 2009). Although the tool measures the four subscales of cooperation, assertion, self-control, and empathy, the video intervention itself is only on empathy, so the following findings section largely focuses on

the results of the empathy SSRS subsection student self-rating, although they were compared to other subscales initially as well.

The SSRS was chosen as opposed to others including the Underlying Characteristics Checklist-Classic, Underlying Characteristics Checklist-High Functioning, the Social Responsiveness Scale (SS) and the Social Skills Improvement System (Aspy & Grossman, 2007; Gresham & Elliot, 2008) because it focuses more particularly on empathy then the others which focus also on interests, communication, vulnerability, and other factors. The Social Responsiveness Scale was designed to measure the type and severity of social impairments found in children and adolescents with ASD and has 65 items, which is too difficult for the targeted demographic to complete. Also the subscales are social awareness, social cognition, social communication, social motivation, and autistic mannerisms and do not isolate the specific social skill of empathy which was the targeted social skill in the current study. The Social Skills Improvement System is a multitiered assessment and intervention system that is used for developing program but is focused on how to evaluate the targeted skills after the intervention but again is much more generalized in terms of the type of behaviours it encompasses to provide the empathy-specific data needed to answer the research questions of the current study (Demeray & Ruffalo, 1995).

In a recent talk in Hamilton Ontario, Canada, Laugeson, a renowned scholar in the area of teaching social skills to children with ASD, referred to the SSRS as “the gold standard in the field.” Laugeson’s recent work looked solely at the subscale of cooperation in exploring perceptions of friendship, and within that area she isolated items that measured attributes relevant to internalizing and externalizing behaviours setting the precedent for the analysis path of the current study (Frankel et al., 2010, p. 123.) Many studies have

employed self-ratings as well as observer ratings of individuals with ASD as a means to gain greater understanding into their perspective when it comes to complex social skills. Self-perception is useful precisely for the inherent bias in the use of self-rating. The only way to explore internalizing and externalizing behaviour, and the motivation behind such behaviours is through the use of self-ratings of those behaviours specifically. Both self- and observer ratings were deemed necessary in this study to provide a more complete investigation into the complexity of empathic behaviour (Fagan & Fantuzzo, 1999; Junttila et al., 2006; Kalyva, 2010; Kavalam, 2007; Koning & Magill-Evans, 2001a; Sedikides & Gregg, 2008; Swann & Read, 1981; Taylor & Brown, 1988; Westen & Weinberger, 2004).

The analysis of SSRS preintervention and postintervention findings was used to determine whether change was evident in the empathy subscale. These results were then compared to the standard scores outlined in the SSRS manual for the empathy subscale. The entire SSRS that the students completed along with instructions are included as appendices for quick reference (Appendices D.1 and D.2). As the SSRS does not contain a collection tool for teacher/ERF rating of empathic behaviour, the exact items were adapted from the empathy subsection of SSRS student self-rating (Appendices D.3 and D.4 for tool and correlation between the items on the empathy subscale and empathy). This tool was given to the ERFs of participants in the study, and the participating ERFs were involved in training sessions outlined in Appendices D.4, D.5, and E.5.

Qualitative Instrumentation. The qualitative data collected during the course of the video intervention played a more supportive role. The observation log created was utilized by the ERFs throughout the study to determine the level of participant demonstration of empathy (see Appendices E.1-E.5 for specific instrumentation and training session

information for collaborating staff**)**. The specific dimensions that were investigated were the observable

characteristics of empathy and two types of outcomes of the exhibition of empathic behaviour as outlined in the theoretical framework: parallel and reactive (Davis, 1994).

Not only was the log administered after the SSRS premeasure but observations were more meaningful in light of the results of the SRSS completion by students and ERFs. This observation tool allowed for flexibility in capturing the nuances of behaviour among participants, which is precisely the type of data that was required to answer the secondary research questions pertaining to how individuals with ASD and ERFs who work with them perceive their empathic behaviour following the intervention.

The log consisted of descriptive notes of empathic behaviour and situational environment; broadly speaking, the goal of the qualitative facet of the study was to capture the perceptions of staff regarding the behaviours of students they work with each and every day. The setup of the log and the constructs listed were constructed in a way to explore the way participants view the social world around them. The log recorded the date and time, contextual information (setting, situation, target), notes on empathic behaviour observed, and the nature of the behaviour (whether it was parallel or reactive). There was also space for ERFs to record any further details gleaned from conversation with the student or connections to the video intervention that were noted (see Appendix E.1 to review the log). This provided context for the later discussion around whether or not the log data supported the success of the intervention but also to later explore the validity of the commonly accepted egocentric worldview of individuals with ASD (Begeer et al., 2012; De Vignemont & Frith, 2007; Fuller, 1995 ; Lee et al, 2012; Rao et al., 2008). The qualitative data gathered

were in the form of participant observation of the intervention group and provided a rich, qualitative facet to the quantitative findings. The rationale was to ensure that the study addressed the inherent ethical issue of social interactions being simply reduced to the preintervention and postintervention survey statistics (Brady & O'Reilly, 2009; Erzberger & Kelle, 2003). The observations were initially designed to not only verify the statistical findings but also to enhance the discussion surrounding the ways that individual participants changed and reflected on their empathic behaviours during the course of the intervention. However, statistical analysis in the following chapters revealed leaner results than hoped for and the qualitative, observational data provided the strongest insights to answer the research questions. The observational log was formed with the intention of guiding data collection toward flushing out the elements necessary to later analyze context (see Appendices E.1–E.5). ERFs determined the empathic type of behaviour, and the specific log details were later used to explore contextual variables to explain changes in empathic behaviour. As a result, contextual analysis within an organized approach was used to analyze situational instances of empathic behaviour.

The theme-coding evolved throughout the project as observational, qualitative data continued to be transcribed and coded in NVivo (Onwuegbuzie, & Teddlie, 2003). However, it was initially anticipated that the coding would be dictated by the situational context in which the empathic behaviour occurred, which is precisely what happened. This occurred during the data reduction stage, where the qualitative data were coded into clusters and networks. All observation log qualitative data from the intervention group was imported into Nvivo and first sorted by participant. Then the data were coded as themes emerged and as data was scrutinized. The prominence of themes was based on the number of times that data

were coded within that theme. However, prominence and significant were not just viewed in terms of frequency; the duration or persistence of a behaviour was also important and instances of empathic behaviour were coded based on intensity as well. Selections were coded and sorted based on themes of when the participants showed generalization of new behaviours in situations involving empathy. As a result, data collection and analysis occurred simultaneously and involved the paring down of data. During the qualitative analysis phase, the data were examined both independently and cross case for discussion purposes. Specific attention was paid to any trends that emerged surrounding the situational contexts of participants' empathic behaviour in order to provide rich, qualitative support (see Figure 2 on following page).

These qualitative data were then used during the analysis phase to provide a personal perspective and detailed description of participant behaviour in situations involving empathy. Therefore, these data were intended to support or refute the quantitative findings of the SSRS and take a dependent, supportive role in analysis. It was initially predicted that it would be the qualitative proof of change that would ultimately determine the effectiveness of the intervention. However, the lean statistical findings were not adequate to prove the effectiveness of video modeling and the qualitative data, it turned out, provided support for the effectiveness. The collection tools outlined above were feasible and suitable for my study, and the collaborative team had access to the resources, time, and staff supports necessary to facilitate mixed methods data collection. Every attempt possible was made to develop procedural guidelines and plan training for participating staff to ensure valid qualitative data were collected during the study (Appendix E.5).

Critique of Instruments: Validity, Reliability and Trustworthiness. In an attempt to address any issues with the data collection tools prior to beginning the study, I conducted a three-tier pilot test including peer research feedback, ERF feedback, and ASD teacher feedback (**see Appendices F.1–F.5)** for protocol used for feedback and samples)**.** Through an exploration of various elements and these phases of pilot testing, it appeared that the data collection instruments would provide meaningful and stable results. To begin with, the first phase of the pilot test included two peer researchers. This process further reinforced the high degree of face validity of my proposed instruments. In terms of content relevancy, all phases of the pilot test commented upon the effectiveness of my operationalization of interpersonal empathic behaviour. Furthermore, peer researcher feedback provided evidence of credibility, as both peers felt that the conceptual meaning and defined dimensions of empathy were adequately grounded in theory and directly observable. The observational log was deemed on all accounts as providing an opportunity to record the nuances of behaviour and feedback provided trustworthiness to the qualitative data collected.

The second phase of pilot testing involved seeking feedback from three ERFs (one in the ASD program and two in other special needs areas). These colleagues answered the rating scale and explored the concepts of the observation log. The rating scale was something most had seen before, and they felt it was explained clearly and easy to use. The participating ERFs noted that the log was very well laid out, the constructs were concrete, and the target behaviours were made very clear. The ERFs, as a collective, all highlighted the clarity with which the constructs were broken down and felt that the observation required was simply noting what they already see and deal with on a daily basis.

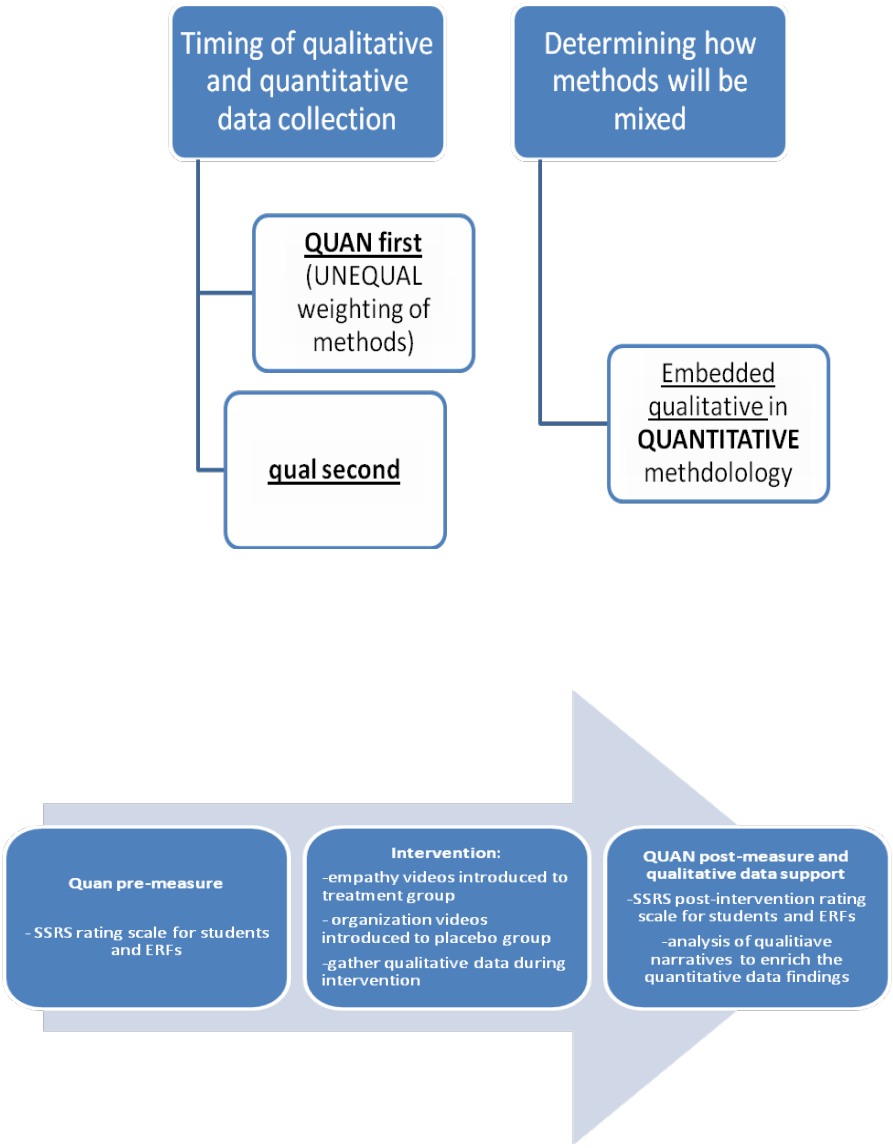


Figure 2

Data collection and analysis path

The reliability of data was supported by the training session provided for the ERFs participating in the study where time will be spent looking at examples of model observation logs. The ERFs felt that this would help to maintain consistency and regularity among data collected by various team members throughout the study. One ERF tried it out with a student for 3 days and reported that it was already proving useful in tracking behaviour of this particular student.

The third pilot test involved an ASD teacher colleague at another school examining the project, administering the intervention, and determining the practicality of the use of video modeling in an ASD program. She reported that she implemented the intervention with ease once she read through the package provided. She added that during the 4 days of the pilot project (including the rating scale, video intervention, and observation log), regular routines were minimally interrupted, which is of extreme importance when working with individuals with ASD. The pilot demonstrated that the videos were easily shown, discussion evolved naturally, and the students were engaged (see the next page-Table 2-for an outline of threats to reliability and proposed solutions).

All data collection, interventions, and discussions occurred during the regular school day instructional periods. These students are integrated approximately 85% of the time but are in the program for at least 15% of every day. The tracking of behaviour occurred when ERFs traveled with students to and stayed with them in integrated classrooms. ERFs already take time to discuss social skills with students as part of their support; the log simply made those discussions more focused on the particular social skill of showing empathy. This log was used to identify themes by tracking with criteria which, ultimately, brought the personal facet to the study and created context of behaviours and in the end provided rich data

necessary for answering the research questions. Similarly, detailed notes are taken on a regular basis as part of the student's Individual Education Plan and used to collect data on student-specific goals and target behaviours (ABA).

Quantitative Data Analysis

Brady and O'Reilly (2009) presented an embedded mixed methods model as "a means of balancing ethical, feasibility, and scientific issues" that arise from randomized controlled experimental research designs (abstract, p. 1). The analysis in this study occurred in different phases at different times, with the two types of data informing each other during the analysis phase. This was done in a specific order in the hope "that like the pieces of a jigsaw puzzle [findings would] produce a full picture of a certain domain if put together" (Erzberger & Kelle, 2003, p. 484; the order was quantitative–qualitative–quantitative; see Appendix F.3). The two types of data were then integrated in the discussion to answer the various research questions following data collection (Appendix F.3).

The analysis path for both types of data followed the stages outlined by Onwuegbuzie and Teddlie (2003) as data reduction, data correlation, and data integration. The reduction of quantitative data was primarily the computation of the statistics of the SSRS preintervention and postintervention measures to highlight trends and to determine if a cause/effect relationship existed between the intervention and displays of empathic behaviour. Such a linear understanding of causality involved "asserting that it can be proven mathematically that any difference between two groups randomly assigned to a treatment or control group can be said to be because of the treatment" (Brady & O'Reilly, 2009, p. 269).

Table 2

Perceived threats to reliability and potential solutions

Threats to reliability	*Solutions I have devised to counter them*
Various observers collecting data	-training session that will explore meaning and examples of specific examples to increase the same understanding of the observational dimensions by the ERFs. - log also contains direction for recording observer's thoughts and problems for discussion at weekly debriefing meetings (outlined in the various appendices).
Interrater and intrarater reliability	- checked prior to and throughout the study using the methods outlined above.
Problems that arise during study	-the informal weekly debriefing meetings will combat reactivity, observer drift, and observational expectancies that may arise during the course of the study. The goal is to keep observation as naturalistic as possible.
Collected data focus on outlined dimensions	-instructions, appendices, guidelines, training session and weekly debriefings will go a long way in ensuring that the data gathered in the observation logs remain focused on the construct of empathy.
Intervention sensitivity	-has been examined with regards to the particular dimensions (interpersonal empathy, parallel outcomes, and reactive outcomes) in gauging the impact of the implementation of the video-scene modeling technique.
Observer effect	-lessened by my data collection tool because ERFs work with participating students for 3 months which will increase the chances of observing natural behaviour. Spot-checking and informal follow-up discussions surrounding instances of empathic behaviour by the researcher will also be used to triangulate the collected data, further contributing to the instruments' degree of reliability.

However, the quantitative data was not sufficient alone to answer the primary research question and needed the additional facet of qualitative data analysis (a): What impact does the implementation of an empathy-focused video modeling intervention have on displays of empathic behaviour among adolescents with ASD?

The quantitative beginning and end of the study involved computing the single *t-test* statistics of the ordinal data gathered from the SSRS empathy subscale in SPSS for each of the groups. The sample data for each group were analyzed to find the value of the SRSS test statistic by computing the mean score. The two groups (intervention and control) were subjected to independent sample *t-tests*; the *t-test* of the SRSS results was repeated preintervention and postintervention on each group independently. These were unpaired groups because they differ on the single variable of the content of the video intervention. The mean of each sample was compared to determine variance between preintervention and postintervention results in each group (control and intervention) respectively and whether that variance contributed to answering the primary research question (a): What impact does the implementation of an empathy-focused video modeling (*MMK)* intervention have on displays of empathic behaviour among adolescents with ASD?

These computations resulted in conclusive knowledge about the self-perceptions and ERF perceptions of empathic behaviour among the targeted group over time and thus contributed to answering the remaining two research questions: (c) How do adolescents with ASD express or speak about their empathic behaviour following participation in a simulation intervention using *Model Me Kids*? and (d) How do the assistants perceive the same individuals' affective empathic behaviour following participation in a simulation intervention using *Model Me Kids?* The emergent data provided grounds for comparison of student and ERF ratings and allowed further inferences to be made regarding perceived and observed expressions of empathic behaviour. In addition, the intervention and control groups were compared using preintervention and postintervention SSRS findings, which allowed for further conclusions and discussion. This analysis path facilitated the exploration of

change noted among ERFs as a group, students as a group, and the relationship between individual students and the corresponding ERF ratings.

Following quantitative data collection the pre and post scores for the intervention and control group were compared to determine if change was significant in terms of frequency or importance ratings. This was done by subtracting the post score from the pre score for each group (control and intervention) for both frequency and importance means to get change scores. The change scores between the two groups (control and intervention) were compared using an unpaired *t*-test in order to determine whether statistical significance was evident to answer the primary research question: What impact does the implementation of an empathy-focused video modeling intervention have on displays of empathic behaviour among adolescents with ASD?

Qualitative Data Analysis

To understand a complex phenomenon of observing empathic behavior, time was spent considering the multiple realities experienced by the participants themselves. It is for this reason that the ERFs who work with the students every day were chosen to be the data collectors. An understanding of the context of behaviour, or natural environment, is paramount when attempting to gage changes in behavior. Emotional content is important when it comes to observing behaviour and the goal of qualitative data analysis in this study was to get a glimpse at the social world of the participating teens. The ultimate goal of data analysis was to uncover emerging patterns, themes, concepts, and understandings through the ongoing development of an analytic framework where concepts were linked to understand the nuances in behaviour observed by the ERFs (Patton, 2002).

In order to uncover patterns, flexibility was required during the qualitative data

collection phase. As data was collected, I sought to develop a logical chain of reasoning and develop converging evidence to explain changes in behaviour noted in the data. This involved taking notes throughout and tracking my thoughts towards a final conceptualization that answers the research questions and offers an understanding of empathic behaviour among this group of teens. As time went on, I would revisit my notes and retrace my thinking and review discarded early thoughts that, with newly collected data, may indeed be plausible. As data was entered in Nvivo for ongoing coding and sorting, the constant questions guiding the coding were: what happened here? Why did this happen? What is this telling me? How can I explain this? How do these connect together? The coding process was complex, constantly changing and led to deep exploration and, finally, discovery. The introspective questioning caused me to become immersed in the qualitative data searching for patterns and meanings.

As data was reduced to extract the essence of the social interaction and behaviour, patterns and themes did not immediately pop out. Rather they emerged within the framework that Patton (2002) described as being open to multiple possibilities or ways of thinking, changing patterns of thinking, making links between things that are seemingly disconnected, and simply playing with the connections made (p. 544). This process was made manageable through the use of Nvivo, which reduced data into chunks. By creating trees and nodes, the data began to show patterns. These patterns were then moved into categories as data collection continued.

Through time the links between those categories gave rise to a network of themes that provided context for empathic behaviour. The qualitative data analysis followed a general inductive approach and no theories were imposed on the data but rather the data

drove the connections and theory developed. The emergence of conceptual categories and descriptive themes were surprisingly a mirror of the content of the intervention videos (this will be discussed in the following chapters). During qualitative data analysis, the metaphor introduced by Seidel (1998) that this type of analysis is a symphony with three elegant notes: noticing, collecting, and thinking was driving the sorting and coding of data.

Data saturation was reached when the intervention was complete following intervention. At that point, new data collecting and sorting confirmed the themes that had evolved over the four-month period. The results were then reported based on the descriptive themes that had been evolving throughout data collection and later analysis intertwined in the context of the conceptual framework for the study as well as the trends that emerged from the literature review of social skills training among individuals with ASD. The discovery of connections in the data supported the effectiveness of the video modeling intervention and raised some unexpected insights.

Chapter 5: Results

Findings will be presented in the following order: quantitative findings (first for the control group and then the intervention group). The conscious decision was made to present the control group findings first in an attempt to provide less repetition while also providing a platform for the intervention group results to be viewed in the context of the control group. In addition, the intervention group contained the additional facet of the observation log, and thus the intervention group quantitative findings were logically presented second just before the qualitative data in an attempt to make the results more accessible for readers. Finally, the qualitative findings are presented by theme in the order of prevalence (those with the most instances come first).

Quantitative Results

Control Group Findings.

Cronbach's alpha, a measure of internal consistency to determine how closely related a set of statements is in relation to the construct that is to be measured, was examined in the initial phases. The SSRS (Table 3) sets out a series of statements in each of the subscales (there are five subscales in the entire SSRS; this study focused on the empathy subscale for reasons outlined earlier). The students were asked for each item on the scale to give ratings in terms of how often they feel they act empathically and also how important they feel the behaviour indicated in the statement is to them on a personal level. Their ratings were based on a 3-point Likert scale for both frequency and importance.

There were nine items used for the empathy subscale measure, each of which was phrased as a statement. Student and staff responses were then scored (as per the scoring guide below) so that high scores reflect high levels of empathy. The SSRS measure

holistically (with all subscales) has good internal consistency and has a Cronbach's alpha over 0.90. The empathy subscale in isolation has a cited Cronbach's alpha of 0.74, which is still measured "good" from an internal consistency point of view where the items are seen as an accurate measure of the construct of empathy (Gresham & Elliot, 1990). The individual items and rating scale completed by participants for the empathy subscale of the SSRS can be seen on the following page.

These totals were then added together to find the raw totals for each participant. Both the "how often" and the "how important" scales were used from participant data. In the case of the ERF ratings only the "how often" scale was used as another person cannot gauge "how important" someone views something to be. The ERF rating also happened both preintervention and postintervention, and scores were also compared to the standard scores outlined in the SSRS manual. The mean scores for the empathy subscale preintervention and postintervention for the control group brought to light findings which will be contextualized and analyzed in the discussion section following the reporting of all results. The following results are presented with the control group first and then comparing those to the intervention group (see Table 4 on the following page for control group data summary).

Table 3

SSRS empathy subscale

Empathic behaviour	How often?			How important?		
	Never	Sometimes	Very often	Not important	Important	Critical
Student says nice things to others when they have done something well	0	1	2	0	1	2
Student tries to understand how friends feel when they are angry, upset, or sad	0	1	2	0	1	2
Student asks friends for help with problems	0	1	2	0	1	2
Student listens to peers when they talk about problems they are having	0	1	2	0	1	2
Student tells other people when they have done something well	0	1	2	0	1	2
Student smiles, waves, and nods at others	0	1	2	0	1	2
Student lets friends know they like them by telling or showing them	0	1	2	0	1	2
Student stands up for friends when they have been unfairly criticized	0	1	2	0	1	2
Student talks things over with classmates when there is a problem or an argument	0	1	2	0	1	2

Control Group Preintervention. The control group had a preintervention frequency of empathic behaviour mean score of 10.35 (the maximum total was 18) with most individual participant ratings close to the average (except one notable exception which was 3.00 and the range of data being between 3.00 and 15.00). However, two participants were removed due to lack of survey completion. The mean of the control group was within the "below average" range of 0–11 found in the SSRS scoring guide, but 10 of the 20 control group participants initially reported frequency scores within the "average range." This group initially rated their frequency of empathic behaviour higher than the intervention group. The items were all scored close to the mean with the exception of item 6 which had the highest score of 12.24 for frequency of behaviour. This item involved how often a student smiles, waves, or nods at those around them. Items 6, 5, and 1 stand out with the highest scores and included smiling, waving, nodding, telling others when they do a good job, and saying nice things.

Table 4

Control group results

Participant	Frequency score (/18)		Importance Score (/18)		ERF Frequency Score (/18)	
	PRE	POST	PRE	POST	PRE	POST
1	14.00	14.00	8.00	12.00	10.50	10.00
2	9.00	-	2.00	-	12.00	13.00
3	5.00	7.50	10.00	7.00	4.00	3.00
4	15.00	10.00	10.00	11.00	10.50	11.00
5	12.00	10.00	10.00	11.00	3.50	4.00
6	12.00	13.00	0.00	13.00	7.50	7.00
7	3.00	8.00	9.00	7.50	3.00	3.00
8	9.00	-	5.00	-	3.50	2.00
9	9.00	12.00	8.00	10.00	6.00	7.00
10	11.00	11.00	6.00	9.00	3.00	2.50
11	8.00	11.00	8.00	9.50	9.50	8.00
12	15.00	15.00	3.00	4.00	14.00	13.00
13	14.00	13.00	11.00	14.00	6.50	7.00
14	13.00	16.00	12.00	13.00	4.00	3.00
15	8.00	8.00	8.00	8.00	2.00	2.50
16	12.00	13.00	6.00	11.00	11.00	12.50
17	13.00	15.00	8.00	6.00	8.00	7.50
18	8.00	10.00	16.00	18.00	3.00	2.00
19	8.00	8.50	8.00	15.00	1.50	2.00
20	9.00	13.00	9.00	7.00	3.50	4.00

Note: - denotes where no data was collected for the participant.

The preintervention survey importance rating of empathic behaviours had a mean score of 7.95; there was a large span in responses with the minimum score being 0 and the maximum score being 16. Most of these scores were in the "below average" range of 0–11, with only two participants scoring in the "average range" when compared to standard scores. There was a large span in data among participants (one was 18 and one was 0) but the majority of participants scored the importance of empathy below (see Table 5 on next page). However, when looking at the findings in terms of items, there was very little span in the mean scores. All items had mean scores between 7.20 and 10.44, which shows very little

variance when compared to the frequency scores. The ERF preintervention rating of empathic scores had a mean of 6.35 with a calculated standard deviation of 3.78 and variance of 13.60.

Control Group Postintervention. The control group had a postintervention survey frequency mean of 11.56 which is only a slight change but not significant. Similarly, the postintervention survey importance rating for the control group had a small increase to 10.33, which shows very small change again (but an increase nonetheless). When compared to the standard scores outlined in the SSRS manual, the means for both frequency and importance ratings are in the "below average range" but closer to the higher end as the span is from 0–13 for girls and 0–10 for boys. Of note, however, is that the postintervention frequency mean is slightly above and thus on the cusp of the "average range" where standard scores are between 12 and 18. Half of the control group participants were in the "average" range while the remaining half were in the lower end of the "below average" range.

The ERF mean frequency rating postintervention for the control group was 6.20, which is significantly lower than the means of 10 and 11 for the student pre/post frequency ratings. The preintervention ERF rating had a mean score of 6.32, which shows very little difference between the frequency of empathic behaviour observed among participants in the control group over the data collection period. Despite lack of change, particular items on the SSRS stood out. Items 6, 5, and 4 were highest, while item number 4 was one of the highest rated ones for both the students and ERFs. The items were: smiling, waving and nodding at others, listening to peers when they talk about their problems, and telling another person when they have done something well.

Table 5

Summary of descriptive statistics for control group

Measure	*n*	Minimum	Maximum	Mean	Standard Deviation
Student Prefrequency	18	3.00	15.00	10.35	3.28
Student Preimportance	18	0.00	16.00	7.95	3.66
Student Postfrequency	18	7.50	16.00	11.56	2.62
Student Postimportance	18	4.00	18.00	10.33	3.51
ERF Prefrequency	20	3.00	12.00	6.33	3.78
ERF Postfrequency	20	2.00	13.00	6.20	3.95

When the control group is examined case by case there are some interesting findings. Of the 20 cases, 7 stayed the same. However, as many participants had lower scores in the postintervention survey when compared with their preintervention surveys as those who exhibited increase, in the postintervention survey scores.

Intervention Group Findings

Although all 10 randomly selected participants were included in the study, two did not complete the importance rating section of the SSRS. It was not discovered until afterwards that only the frequency section had been completed. When probed as to why, one participant "did not get why there were two different sets of numbers for each question." The other participant who did not complete the importance ratings has very low verbal ability and just wrote down "I am not doing that." It is worth noting that despite using a guided exemplar and assistance with survey completion, some of the participants simply did

not understand but it is assumed that their responses are still valid indicators of empathic behaivour. The guided exemplar was used by the classroom teacher (so both groups had equal preparation and practice) and was around study skills. She made the rating scale look similar and went through and explained the different options on the Likert scale. They did a guided example together and the teacher had them circle the most appropriate answer. There were ERFs and staff in the room to help if a student could not read a word, and also there were rulers on the table to help ensure they were circling the desired selection. It is not uncommon when working with this group of students for such inconsistencies to occur. The SSRS has been used in many studies with this particular population and is frequently used with students who have ASD or developmental disabilities (Bauminger, Shulman, & Agam, 2003; Wang & Spillane, 2009; Williams White et al., 2007).

Interestingly, in the postintervention surveys completed later, a different student did not complete the importance ratings but both of these participants did. There was no pattern evident in terms of fully completing the surveys and participants were removed from analysis if they only had data at one data point.

Preintervention Intervention Group Findings. The preintervention mean of 9.35 for the intervention group and the preintervention importance rating was 9.06 (see Table 6 on the following page for a summary of intervention group findings). As discussed in the methodology section, self-rating brings issues with bias, and equivalency between groups is not always easy to establish but one can assume equal bias in the two groups so it likely did not present any issues with equivalence. However, in this case, reviewing the student profile chart (Appendix B.7) shows that both groups had a range of students with varying levels of ASD and cognitive impairments.

In all cases but 1, Deborah, participants rated their preintervention frequency totals higher than preintervention importance total ratings (one participant had both totals as the same). Two participants had extremely high preintervention frequency totals of 15, while most participants had between 9 and 12 as their rated scores for how often they felt they displayed the targeted empathic behaviours prior to the intervention. Overall, the preintervention frequency mean was 9.35 and the preintervention importance mean was 9.06, which shows very little difference. None of the participants in the intervention group rated themselves with a 0.

Table 6

Intervention group results

Participant	Frequency score (/18)		Importance Score (/18)		ERF Frequency Score (/18)	
	PRE	POST	PRE	POST	PRE	POST
Harry	6.0	-	5.0	0.2	0.0	1.0
Deborah	8.5	10.0	10.5	10.0	7.0	9.5
Jennifer	15.0	15.0	13.0	16.0	9.0	11.0
Terry	6.0	9.0	-	0.22	4.5	6.0
Aaron	3.0	11.0	3.0	7.0	10.0	11.5
Richard	9.0	9.0	-	9.0	0.0	0.0
Jeffrey	10.0	10.0	10.0	-	1.5	4.5
Shawn	9.0	11.0	9.0	6.5	10.0	12.0
Herald	15.0	17.0	12.0	16.5	1.0	1.5
Robby	12.0	11.0	10.0	10.0	9.0	11.0

Note: - denotes where no data was collected for the participant. Also the names listed are pseudonyms.

The lowest items rated in the preintervention survey for the intervention group were items 9 and 1, all with scores well below 8 as the item mean ratings for the frequency of behaviour among participants. These three items include smiling, waving, and nodding at others, talking things over with classmates when there is a problem, and saying nice things to others.

The preintervention survey from the intervention group had a mean of 9.6 (see Table 7 on following page), which is on the higher end of "below average" standard scores outlined in the SSRS scoring manual (these range from 0–11 for boys and 0–13 for girls respectively). Four of the participants scored in the "average range" with scores between 12 and 18, while the remaining 6 participants had scores that fell within the "below average" standard scores outlined. The findings here also highlighted items 8, 3, and 5 rated to be the most important with means between scores spanning from 12.4 and 10. Items 3 and 5 focused around asking friends for help with problems and telling other people when they have done something well. Item 8 had to do with standing up for others and was not an item that stood out in the control group findings. Another item that was rated as being important was asking for help from others as well.

The initial ERF preintervention frequency ratings had a mean score of 5.20 and a standard deviation of 4.51. This showed that initially ERFs rated students' frequency of empathic behaviour far lower than the students perceived their own behaviour.

Table 7

Summary of descriptive statistics for the intervention group

Measure	*n*	Minimum	Maximum	Mean	Standard Deviation
Student Prefrequency	10	3.00	15.00	9.35	3.87
Student Preimportance	8	3.00	13.00	9.06	3.41
Student Postfrequency	9	9.00	17.00	11.44	2.74
Student Postimportance	7	6.50	16.50	10.71	4.01
ERF Prefrequency	10	0.00	10.50	5.20	4.50
ERF Postfrequency	10	0.00	12.00	6.70	4.79

Postintervention Intervention Group Findings.

All participants in the intervention group had frequency mean scores of 8 or above, and the mean among the intervention group was just over 11.45 which marks an increase in perception of self-rated empathic behaviours. This total of 11.45 is within the "average range" according to standardized scores for male participants. When the two female participants are examined, Deborah scored below the standard score of 13 and, thus, her empathic rating was "below average," whereas Jennifer's scores were in the average range. Overall, the group moved from the "below average" range to the "average" range in their rating of the frequency of empathic behaviour when compared to the standard scores in the SSRS manual. The postintervention importance mean, on the other hand, was 10.71, which was only a slight increase, and not statistically different, from the preintervention mean of 9.06.

Items 4, 6, and 8 were the highest rated in terms of frequency in the postintervention survey, with the intervention group having mean scores between 14.04 and 13. It is noteworthy that item 6 was also high in the preintervention as well (it involves smiling and waving to others). However, item 8, which focused on standing up for someone who is being picked on and listening to others, stood out as increasing as well. Item number 4, which was listening to others, showed the most drastic increase but was also not deemed a frequent behaviour in the preintervention survey.

Items 8, 3, and 4 were the highest rated in terms of the importance of empathic behaviour; item 8 was still the highest rated but did not display the largest increase. The item with the largest increase was item 3, which involved asking friends for help with problems. Both of these items were highlighted in the preintervention survey as well as in the postintervention survey. However, two other items were similarly increased: listening to peers and telling others when they have done something well.

The preintervention and postintervention student ratings were compared with the ERF ratings for frequency of behaviour. The ERFs rated all the students much lower on all items (preintervention mean of 5.2 and post mean of 6.70). In fact, these ratings were lower, with most participant scores below 8 on average for each item and one participant even as low as 0, which is in the lower end of the SSRS manual standardized scores. There is an increase, however, to be noted in the frequency rating mean for both the student ratings and the ERF ratings.

Items 5, 6, and 1 were highest (the only totals with scores above 8), which is consistent with how the students scored themselves in their self-ratings despite the ERFs scoring students significantly lower on all items). These items, though, are the same as the

initial survey, with the addition of saying nice things to others. The mean frequency total for ERF ratings among the intervention group was 6.70. This percentage is lower than the participants' self-rating, which is also statistically important. The ERF postintervention survey ratings also confirmed an increase of 1.45 standard deviation rise in the frequency of behaviour which was lower than students but did show a positive trend in empathic behaviour as the result of video modeling using *MMK.* Holistically, control group participants statistically scored their own frequency of behaviour much higher than did those who observed their behaviours (11.44 vs. 6.70).

When explored participant by participant, a number of participants in the intervention group showed major increases while others reported the exact same results. Although some change was only slight, many scores increased during the course of the study. The pre and post scores for the intervention and control group were compared to determine if change was significant. As Tables 5 and 7 confirm, the change was not statistically significant in terms of student reported frequency or importance scores for empathic behaviour. This was done by subtracting the post score from the pre score for each group (control and intervention) for both frequency and importance means to get change scores. The change scores for the control group were 1.20 for frequency and 2.38 for importance. In comparison, the intervention group change scores were calculated as 2.09 for frequency and 1.66 for importance. When the change scores between the two groups were compared using an unpaired *t*-test, the resulting p value of 0.08 did not reach statistical significance.

Qualitative Results

The following headings are the themes that emerged during qualitative data theme coding: including others, showing interest in peers, empathy of the highest level, body language awareness, compromise, and friendship. The qualitative data coding was not simply based on the frequency of a particular empathic behaviour because significance is not simply determined by the number of occurrences. Instances of empathic behaviour that were intense or persisted for longer periods of time were coded as the most significant. In the statistical findings it was the more "motor" empathic behaviour responses that stood out in individual items, but in the qualitative data findings an alternate, personal facet came to light. It was the emotional and cognitive facets of empathy that were observed, probed, and reflected on in the observation logs, allowing them to be factored into analysis. The changes noted in the qualitative data shed light on an inherent impact that statistics had not deemed significant. Upon analysis, the common themes that emerged were tightly aligned with the focal point of the individual videos in the intervention (Appendix C.1).

Creating Context Through Observational Data

Upon examination, the majority of the observational log data were more in the vein of creating social context and detailing the physical behaviours of students while watching the videos. There were 14 different references from six different sources most of which gave tremendous insight into the complexities of observing behaviour. Many of the references were observational statements by the ERF such as Harry who was "sitting still in a thoughtful manner for nearly 30 minutes" while watching the videos and Robby who was "very keen and interested in watching [the videos]. He would regularly ask to watch them." Robby did note some frustration on one occasion that "it doesn't matter. I don't really get it.

I am trying to learn the way to show people I care about their feelings but it is just so hard. Too hard." Terry, who demonstrated an increase in frequency of empathic behaviour based on self- and ERF ratings, while watching "that is Jim" seemed to not be interested and was "tapping his feet and biting his nails, looking here and there, laughing, playing with the computer keyboard." However, following viewing, Terry was able to recount and discuss the video to the most minute detail.

There was a disconnection between what the ERFs observed initially and what the explanation was on the observation log.

Observational data collected for Aaron, who demonstrated increases in survey ratings, gave a clear sense of his behaviour while watching the videos. While he "showed interest most of the time; he was looking at the screens of others as well to see which videos they were watching and then would initiate conversations about those if he had previously seen the videos." On one occasion he made the comment that "compromising is important, over pizza especially," which was completely disconnected from the video he was watching that day or anything happening that day (there was no pizza for lunch). Afterwards, he connected it to the earlier video about making compromises and said he had been reviewing it in his head to "remind himself to do it"; this shows issues with transferring the learning to new social situations. At other times he seemed "very complacent and unengaged in class; he was slouched over in his chair with is feet stretched out and gazing listlessly." In contrast to how disinterested he appeared to the observing ERF while watching the videos, this participant would verbally recall details from the videos days later. Despite Aaron's observed "disengagement" while watching, he did engage with the content and people in the

videos and would recall them and make reference to specific scenarios later in the day, week, and even in one case month ,based on ERF rating.

Other participants whose overall totals dropped or stayed the same were observed, as in the case of Herald, appearing "defeated" while watching the videos. For example, on one occasion, he seemed to spend viewing time "looking at the computers of others; he was looking under the desk and playing with headphone wire. " Afterwards when the ERF asked him why he was not interested in the videos he said he was, but "I was watching the one about body language so while I was listening, I was looking around at the people in my class." This particular example brings light to the idea that observable behaviour is not always necessarily indicative of the level of engagement or engagement at all. For example, it was observed that another participant "while viewing the videos, constantly touched his head and looked away from the screen. He was able to recount what happened and discuss later though."

Including Others

This theme was the most prominent theme to emerge from the qualitative coding phase based on number of instances noted in the observation log as outlined in the earlier instrumentation section. A number of observations were made around five of the participants with regards to their responses to situations that involved including others. Deborah and "Jennifer," who showed improvement over the course of the study, were observed making marked attempts to include others after watching the videos. The day that Deborah watched the video on including others she was doing a puzzle near the end of class and she asked another student, who was sitting on his own, to join her. It was a student she does not usually socialize with. When asked afterwards by the ERF what made her decide to

act that way she reflected that “I was busy doing my puzzle and looked around. Everyone was busy. He was not. I tried to see what his body was telling me and he did not seem happy. He looked sad and was watching everyone else be busy.” The ERF nodded and the student said “yeah. Like the video one that taught me about reading other people like you read the words on a page of a book.” This was an example of emotional empathic behaviour where Deborah showed concern for a peer and offered to include him in an activity. Her response had all three levels of empathy, which is something that was not noted in the statistics per se. She did not reproduce the observed feeling but rather noted how he appeared to feel and then demonstrated interpersonal empathy, which serves as evidence that the content of the video had transferred to a naturally occurring situation in this situational context for this participant.

Similarly, Jennifer, who showed an increase in empathic behaviour during the study, was also observed making marked attempts to include others. One day in November, she approached another participant and said that she was sorry they had not let him play on the WII with them the day before; they did not have any more controllers, but she “knows what it feels like to be left out.” She told the ERF later that day that she didn’t want that person to feel “like I do in my English class. I know he wanted to play so I wanted him to know it was not because we did not want him to play. I should have given him a turn.” When she said this, the ERF observed that “she looked sad.” She had read his emotions and then felt bad for her part in making him feel left out. This showed a combination of reactive and parallel outcomes because it made her sad to know that she had played a role in someone else feeling hurt. An interesting aside is that the female participants in the study were observed the most often making attempts to include others in naturally occurring situations in qualitative logs.

The theme of including others was also observed in participants who showed less change or remained the same during the course of the study. For example, Harry, who showed negligible change throughout the study, "moved his chair over one morning to join another group rather than sit alone." The antecedent to this action was when he looked around and realized that everyone else was partnered up because the class was going to be doing group work. Later that morning, when the ERF asked him what made him move over, he wrote that he wanted to be included and "wasn't being left out on purpose." This is a mirror image of the video on including others where the direct teaching was to follow two steps: "Think of others and invite someone who might feel left out." His reaction was that he waved another student over to sit with him at his table when he saw the student was alone. This occurred three days after he had watched video #7 which is all about including others. This showed a similar behaviour to what was noted on the earlier occasion, but this time he showed a reactive outcome in his behaviour: He was able to apply his feelings to another. He reflected in writing that "when he was sitting alone, he felt left out so he wanted [the other student] to be included."

Similarly, Jeffrey and Robby, who statistically stayed the same and showed no change throughout the study, began to display empathic actions a week into the observational period of the study, according to ERF observations. There "were numerous incidents of isolated empathic actions that were not simply parallel reactions on the part of [Robby] For example, he was observed including others in activities and projects." However, the ERF observed that the behaviour appeared to come more naturally to him as he is more social. Jeffrey also began to vocally include others in activities by asking "do you want to join in?" On seven occasions during the observation period he showed interest in

others when they were near and asked them personal questions about their interests and their lives. Despite most of this being very scripted surface dialogue, he did tend to ask questions that included others and also build on his active listening skills which were major areas featured and directly taught in the *MMF* videos.

Showing Interest in Peers

Terry, who displayed a marked increase during the study, was observed to be a teen experiencing difficulties making friends. He was observed trying and showing a willingness to help others on two occasions in October: once when someone was not feeling well, he said he did not feel well, but the ERF observed "he kept looking at the other student. His sadness seemed to come from the way the other student was feeling." On another occasion, when students in his class had to choose a partner, he noticed there was an odd number in the class; he approached the other student and "asked him to join he and his partner." Terry showed interest in the feelings of others and even mimicked the language of video #9 which set out the following steps in showing interest in others: "listen, talk about the same thing, and ask questions."

In a similar vein, Aaron, who showed tremendous improvement statistically, was observed showing interest in a peer's hobby and asked another student, "How long have you played guitar? Why do you like playing it? You are good at it." After the conversation he turned to the ERF and quietly said, "I noticed he likes playing at lunch so I asked him about it to let him know that I want to be friends and give him attention." Aaron had noticed on this occasion that you have to demonstrate interest in others and relate to them even if you do not have the same interest. He told the ERF that he "learned that in the video where the kids are playing on the computer and discussing holidays." Another noteworthy example of

showing interest in others occurred when Aaron felt bad for another student. The peer involved presents very low verbally and is really struggling to be integrated in the high school environment. Some students in the class were saying they did not want to sit with him. This student told the teacher that "I want to sit with him. I like to help him and show him things." He also affirmed that "he learns by showing so it works for both." Later in the week, he told the whole class when they were discussing what they had learned that week that he likes to "include everyone and no one should ever feel left out in this class. We learn how to pay attention to the feelings of others here." The classroom teacher identified Aaron as a leader in the class in directing natural conversation about social skills. It appeared to the ERF observing his behaviour as "though the videos gave him a framework or point of reference to work from."

Students who showed less or no change during the study did not have rich observational data in this area, although there were some minor instances noted. For example, in the later part of the study Harry began to show interest during class discussion and group work times. He was observed as often looking at others when they were speaking and mimic what was shown in video #9, although he would not or could not verbalize this. This showed a direct attempt to "listen to others," which was the first step modeled in the video to let someone know you were interested in them. The ERF noted that he had gained some understanding, as she found those skills written down in his agenda and repeated aloud on a number of occasions, pointing to the importance that the participant had placed on learning how to show interest in others even though, statistically speaking, gains were not overwhelmingly evident in the survey findings.

Likewise, in November, Herald, who showed little change during in ratings, was observed as he "approached a female student he does not know in the hallway between classes and asked her if she was into boys or girls. The girl just stared at him and said "What?" The ERF recorded a conversation she had with him after that when he expressed that he thinks she is pretty and nice and wanted to show her that he liked her. After discussing the way that comment came across, he concluded that "you show interest to make people feel good. Not uncomfortable. What I said made her uncomfortable." They worked on alternative conversation starters to show interest. The participant even took initiative and was observed watching the videos through his lunch hour the same day. The next day he asked her if she liked movies, what were her favourites, and they had a short conversation. The ERF observed that the "student was pleased that she had spoken to and smiled at him and the girl seemed comfortable." This was an example of a more scripted attempt to use what had happened in a video, video # 9 specifically, where the focus was showing interest, and it outlined that you have to ensure that the attention is positive. The student was working on how you can factor in the feelings of others and show your interest in others in a positive manner. An interesting link with this particular theme was that the most frequently recorded words in the qualitative, observational data were all pronouns and included: he, I, she, his, him and her.

Empathy of the Highest Level

Perhaps the most important theme that answered the research questions directly was the data that were coded as observations marking instances of empathic behaviour of the highest level. Although not the highest in terms of frequency of examples, some of the most powerful and contextually rich examples were coded within this theme. There were many

references in the data to this theme, but all those references came from the same four participants. Interestingly, these were not necessarily the participants who showed the greatest increase between the preintervention and postintervention surveys.

Jeffrey, who appeared to show no change during the study, created a comic for a student in the building who was in hospital with some mental illness and memory concerns. He stated: “Our friend’s got amnesia, the doctors and nurses are there to help you feel better, we will keep sending our love, you keep getting some rest, when you’re better you’ll be able to come to school.” This comic was thoughtful and he was proud he had made it on the weekend. He showed it to many others on the Monday morning. He told the ERF who was with him that “I miss my friend and am sure that she feels so sick. I wanted to do something to make her less sad. I made this to help. I want to still be friends with her.” This showed empathy and knowledge of what to do to help friends in need to maintain friendships as highlighted in video #3 (see Appendix F.5 to view the comic).

In December, Herald (who also demonstrated a slight drop in scores) sent an email to his teacher as part of his final assessment. He was to send five questions that he planned to ask his teacher in his scheduled interview and he sent: “When will you stop bothering me? Why do you have to be a waste of time? When will you be useful? When will you start teaching?” When the ERF and teacher read what he had sent, the ERF working with him and the vice principal spoke with the student. When asked by the vice principal how he thought the teacher felt reading those questions he said, “probably pretty bad. It was a mean thing to send. I don’t know why I sent those ones. I like my teacher, and those were mean things to say.” The ERF observed that the student did “appear to feel bad about how he made the teacher feel. He even had his head down while being spoken to.” Later the teacher spoke

with him and said he could ask any questions he wanted to ask but the student explained that he did not mean to "hurt him." The student expanded that he "can't really think about other people until someone reminds me. Like when [the VP] read the email out and said to pretend I am my teacher, would I feel good hearing this? I can see now that it was a mean thing to do but I was just thinking about myself. I do that always first. I need to work on those steps of how to use empathy." This reference was to video #3 where the steps in showing empathy are outlined as "watch my friend, listen to what he/she says, and offer comfort."

On one occasion Shawn, who dropped slightly in his own rating of empathic behaviour, discussed an argument that had occurred on the weekend with a friend from a different school. During sharing time, he brought it up and said that "as mad as I am I have to look at what I did and said too." During this discussion another student mentioned it was like that girl, Misha, moving away in the video she had watched that day (video #3). Shawn agreed and then said that "he may have copied what she had said when speaking about it now." He said he would "go home and call and talk about it so that we can understand each other and get over the stupid thing." The peer inquired about the outcome the next day, and the student said that he had called "and everything was fixed. We are going bowling on Friday! Talking about it works, I didn't know how he felt and he didn't know how I felt."

Shawn, was also observed one day in November walking down the hallway and opening the door for a student in a wheelchair after seven other students had walked by and not helped. He told the ERF that "he saw that the boy felt ignored and why don't more people help. We have to try and read others even if it is wrong sometimes. It is worth trying anyway. Just like the video I saw about body language." In his discussion, the ERF noted that he "seemed to be standing up for others when they had been treated poorly and also

tried to understand how others feel in the situation." At the end of the term (and study), Shawn was writing a journal entitled "what have I learned about myself in this course." The student wrote that "I have learned that everyone has feelings. I need to remind myself to stop and look at others. There is a way to notice that I think I am learning."

Body Language Awareness

Body language awareness while watching the videos was a salient theme that emerged from the observational data collected by the ERFs. This theme was also observed and noted among participants who showed improvement, showed no change, or slightly dropped during the study. Aaron, who showed a marked increase, was observed as seeming "very complacent and unengaged in class; he was slouched over in his chair with is feet stretched out and gazing listlessly;" after 10 minutes of class activity planning a fieldtrip he looked over at the ERF and said "with all the videos we are watching and all our talking about seeing how people are feeling how come no one asked me!" The ERF replied that she was taking notes and waiting to see if he would react in some way or if another student would (which did not happen). The student then got the attention of everyone and told them to look at how he was sitting: "What am I saying with my body?" In essence, he gave a minilesson in body language awareness similar to what is shown in video #12 where you have to read what is wrong with someone from what their body says by following the steps "read the face and read the body." The ERF observed that "the student seemed to want to help the others learn. At the same time, he verbalized how he was feeling, tired and sad, and even sadder because no one noticed." The student stated that "I felt bad before. I felt even worse when I realized no one noticed. I felt like no one cared."

Likewise, Robby's body language struck the ERF observer as noteworthy. On a number of occasions he was seen "slouched over at his desk, yawning, and watching the clock." On one occasion the teacher asked him how they could make the activity that the class was doing together more fun, and he answered "I am having fun. It is great." The teacher came over and sat down and copied the way the student had been sitting. The student began talking about the activity, and the teacher acted bored. The ERF noted that "he seemed bewildered and stared at his teacher with his mouth open and said, that is not what I was doing!" He then stopped and looked at his body language and "immediately sat up." He wrote in his book that "if I am interested I need to make sure I look interested. We almost stopped playing Bingo because I looked bored." The ERF followed up the next day with a discussion around how important those things are: "the way we appear to others and the way they appear to us." The student did understand this and was able to reflect on what our bodies say about how we feel. A few days later the same student was observed looking at a peer and then going over to ask if everything was okay. The peer "had his head down on his desk and had been quiet since arriving at school." Later he told the ERF that he was starting to pay more attention to "what people say with their bodies and how their bodies are good clues to how they are feeling." This was exactly the video that the student had been interested in that week and had viewed a number of times, seven times according to the observation log, which shows a movement toward generalization of the video content to naturally occurring social situations.

Herald, who showed a slight decrease in self-rating of empathic behaviour during the study, was observed as having disinterested body language and spent his time "looking around the room." When the ERF asked him why he was not interested in the videos he said

he was, but "I was looking for body language." This was the day that he was watching the video on the importance of body language when learning how to read people. The ERF asked him if he had ever tried to do that before and he said "no. I didn't even know what it was. I didn't know you were supposed to or how. Now I need a way to remember to do that. Can you make a cue for that? Maybe we can put it in my pocket?" A cue is a visual cue card for the process of something that is incorporated in ABA frequently. It breaks down a series of steps into small visuals and serves as a visual reminder to refer to as needed.

Rejection

The theme of rejection for all participants in the intervention group, but the richer samples came from three participants who showed an increase in empathic behaviour during the study. Deborah was observed in a situation where she felt left out and did not know what to do. She had bought her lunch in the cafeteria but did not know where to sit. She chose to sit alone and was observed as "looking sad and forlorn." A discussion later revealed that she had wanted to approach others "like they showed in the video about including everybody, but I was scared that people would be mean." The next time she was in the situation, she did go and sit down with a group of kids. She reported to her ERF, "I did it and they let me sit there! I am going to the cafeteria more."

Jennifer did not come to school until late September, which was an unfortunate case for a student entering grade 9 as she arrived after initial common bonds had been formed among students in most of her classes. She felt rejection in her English class in particular and often commented that "people are mean to me in that class" and "they don't like me at all." She kept repeating, "I am just trying to focus on learning and don't care." She was observed on a number of occasions verbally telling herself that "she should not get upset"

and “not stop talking” because not everyone will like you (like video #6); in this case it was particularly important as, historically, this student did not speak for a number of years as a child—she is encouraged daily by the ERFs and teachers who work with her to continue to ask pressing questions but also to be mindful of not dominating the class (which is what appeared to annoy her peers in her integrated English class). Video #6 outlined the following steps for dealing with rejection: “try to join in, invite a friend, and stay calm if it doesn’t work out.” Success was noted with this participant in the observational data as she was less and less rejected by her peers in English class and dealt with rejection better and then began to include herself in class activities. By early November, she was able to recognize when she was annoying her peers and stop asking questions and write them down for the teacher; she did not want to be rejected by others and began to reflect on her behaviour in an attempt to curb her feelings of rejection.

Aaron was found in a similar situation when he was feeling hurt by comments that another peer had said. Rather than addressing his emotions, he completely shut down in class and became very hostile toward anyone who approached him. The ERF working with him asked him “what can I do to help,” and he replied “probably what you are good at—nothing!” He ended up taking a break in the class next door until he was ready to talk about what was bothering him. He was hurt by comments a peer had made about his clothes; he “felt rejected and hurt.” Shortly after, the ERF brought in the other student to discuss what had happened and both talked about what it feels like to be left out or judged. Aaron even connected his feeling of rejection to one of the scenarios depicted in video #6 saying, “I felt like Andrew did when he wanted to play basketball. I want to be your friend, and you made fun of my Old Navy shirt, saying it was so lame.” They were able to talk it out and return to

class. The student had voiced his feeling of rejection and was able to resolve the negative feelings. The peer, Herald, had shown empathy in the same conversation saying, “I didn’t think of how I could hurt you with that. I feel bad. Next time I will not say things that hurt you. And if I do, tell me so I can fix it.”

Compromise

The theme of compromise also stood out in the qualitative data analysis phase as participants were observed in social situations. Again, the three participants who were overwhelmingly observed in situations involving compromise were the same students who showed the most improvement during the study (Terry, Aaron and Shawn). Terry was going through intensive IBI therapy during the study and, thus, missed two days of school per week during the semester. In his IBI sessions, some of his scripts dealt with how to compromise when he wants or needs something. This focus was due to a lack of compromise when something is asked that the student does not want to do. There were many visual supports and scenarios being discussed that focused on when it is the right time to request something and when it is not. This behaviour had been noted as “incredibly difficult” during the first few weeks of the study. However, with time and support, the student became “tolerable to the wishes of others and began to exhibit the early signs of turn-taking.” He even took turns during a game of Uno in early December, something that had never been observed prior to that point, and when the class played a game he usually played only one turn and then refused to participate once others took a turn.

Aaron showed the ability to reach a compromise on a number of occasions. In one instance, he was observed before class starting to talk through a problem with a peer to reach a compromise and avoid a larger conflict. It was pancake breakfast day and he wanted to be

the one to make the pancakes, but it was his turn to wash the dishes. Initially, he totally shut down and stated, “I am not hungry so I am not helping.” Then when the teacher commented that all of the team had to be helping and doing their assigned tasks or no one would be getting breakfast, he approached his team and said that he would do the dishes as long as there was a “helper,” since he felt it was always “rushed at the end of the period.” The teacher did not have to guide the compromise, and it played out just like when the kids in video #10 are trying to decide what to have for dinner and toppings for a pizza; you have to be aware of the feelings of others. The steps outlined in video #10 are “listen to the opinions of others, give in sometimes, and stay calm if you don’t get your way.” The student was applying those steps and was observed commenting that “at first I didn’t care, but when I took a second and looked at the others, I realized I could help. So I should help. So I helped.” Aaron displayed reactive empathic behaviour in this situation and had read the emotions of others to be willing to compromise. His behaviour would have had a consequence for everyone involved and they would have missed out on the pancakes.

Similarly, Shawn was observed as “beginning to link various strategies together into his dealings with peers.” One day in particular, the student was fighting with his group members in class while playing a board game. They were arguing about a play and he said, “who cares. We can do it your way. As long as we are still playing, it doesn’t matter who is right and who is wrong.” When the ERF later asked him what made him do that, he referenced video #10 “where they are taking turns on a group project and trying to make deals. It was like that. I got over it and we moved on.”

Friendship

The final theme of note that emerged from the qualitative observational data was that of friendship. In many ways, this theme came through the examples cited in other themes. They are all facets of friendship, which is why it is fitting that the video collection used in the intervention was entitled *Model Me FRIENDSHIP*. There were noted examples of friendships forming in the observational data collected for two participants during the course of the study. Deborah was noted on several occasions exhibiting awareness of friendship and being empathic toward people with whom she wanted to be friends. The same example discussed earlier about her sitting alone in the cafeteria provides support for this theme as it reflects that although she felt rejected and did not make an attempt at friendship, she later reflected that if she wants to have interactions in a group she "needs help. I ask, I get support"; this is exactly what happens in the video. Three days later she was observed asking a peer for help with a journal topic; she said, "I need your help. Are you willing to help me?" Her friend helped her develop the topic around what would make the best circus in the world. Afterwards she said, "you are such a good friend. Thanks for helping me. I really needed it." This was exactly what was modeled in the video on maintaining friendship, where the skits demonstrated that you ask for help when you need it and help your friends when they need it.

During the course of the observation period, Deborah began to make a lasting friendship with a peer who also has similar interests (video games and cartoons), and they began to spend time together before and after class. In early November, she saw that her new friend was upset and approached her friend to see if she could help; she mimicked exactly what was shown in video #11, which presents making friends as "remember things about him/her and make plans." Another day she was observed asking her friend to come

over on the weekend and said, “then we have made a plan.” She was testing out the steps presented and, as the friendship strengthened, she was content.

Herald also showed isolated examples of developing friendships. In late November during the unit on email as a form of communication, the student was having issues knowing what to say and what not to say to people with whom he wanted to stay friends. There were occasions of replies to emails from others where he would say, “I don’t care about that stupid movie. You are a baby for liking it. A good movie is . . . .” There were lengthy discussions and activities developed around this, and the student formed a list of ways to start emails. In time, he reflected that “I save the email before I send it. Reading it over again and thinking about it is better to make sure that you don’t hurt anyone’s feelings. I want to make friends. I don’t think I have had one before.” This showed how his empathic skills had developed over the semester as he began friendships and used email as a way to forge and maintain those friendships over time.

Chapter 6: Analysis and Discussion Findings

The following discussion of the reported findings is organized by research question and combines both quantitative and qualitative results. Although the quantitative findings demonstrated limited impact there were emergent trends that brought forth greater understanding of empathy among this group. The trends warrant discussion and, when coupled with qualitative data provide evidence of the impact of the intervention.

(a)What impact does the implementation of an empathy-focused video modeling intervention have on displays of empathic behaviour among adolescents with ASD?

Despite minimal change noted in the quantitative results, there are several points of potential impact that stood out when quantitative data are interpreted. Overall, the implications of the impact of the intervention can be summarized as displaying increases in motor empathy, making ties with curriculum, and a change in participant perception of empathy. The preintervention survey importance rating of empathic behaviours for the control group had a mean score of 7.95, but the large span in responses (minimum score being 0 and a maximum score of 16) highlighted that the majority of participants scored the importance of empathy below 10 (which brings to light the view of participants that empathy is not an important skill).

Neither the control or intervention group demonstrated a statistically significant pattern between results from the preintervention and postintervention surveys. In essence, there was no correlation between a rise in preintervention or postintervention surveys or among frequency and importance ratings to prove that the video modeling intervention had an impact on empathic behaviour of participants. However, the majority of participants in

the control group had consistent scores in preintervention and postintervention surveys, which goes to support the hypothesis universally accepted in the literature that these individuals do not easily factor in the feelings of others around them as a natural response in social situations (American Psychiatric Association, 2000; Kanner, 1943; Waterhouse, 2000; Wing, 1993). There was little to no change, thus providing support for an inherent empathy deficit and shows that what was happening at the time did not impact their scores. There were individual cases where change was noted, but there was no pattern established within a particular participant or within either of the groups.

It is striking that participants scored themselves around or above the preintervention frequency mean of 9.35, an argument can be made that the participants in the control group perceived themselves to exhibit the behaviour more often than they believed empathic behaviour to be an important quality to exhibit. The preintervention importance mean was 9.06, which was very close to the average preintervention frequency total, showing that there was very little distinction to be made initially between the importance and exhibition of empathic behaviour. The control group had a postintervention survey frequency average of 11.56 which, although a slight increase, is less than half of the change later noted in the intervention group. These minor increases could be due to curriculum focus on the character traits, including empathy, which occurred in the general learning strategies classes or the school-wide initiative around increased character education. However, with empathic behaviour frequency and importance ratings beginning above 9 in this study, there was support for the theory of "empathy deficit" inherent among individuals on the autism spectrum.

Similarly, none of the participants in the intervention group rated themselves with a 0, which shows an evident level of understanding of empathic behaviour in itself. Perhaps this learning led intervention group participants to observe themselves as more empathic but may not have changed their initial preintervention survey view of whether or not they personally felt such behaviour is important. All participants in the intervention group had frequency total means of 8 or above, which demonstrated an improvement in overall frequency of self-rated empathic behaviour. The postintervention frequency total mean among the intervention group was just over 11.45, which, although not statistically significant, is an increase in perception of self-rated empathic behaviours.

ERF ratings among the intervention group did, however, show an increase in frequency scores overall, from 5.2 to 6.70, and had most participants increasing. However, this positive trend did not continue in the analysis of postintervention importance totals. In this case the mean was 8 and thus there was very minor change noteworthy as the pre- and postintervention rating range was less than 1.65. In fact, the change was so minimal in the importance totals that it seems to be that perception of the importance of empathic behaviour did not change but that only the frequency of displaying such behaviours did, moving from below average to average ratings. This change, when viewed in the context of participant demographics, is striking—the majority of students were very below average in terms of intellectual functioning, but many made gains in complex empathic behaviour ratings by ERFs during the course of the study.

There is limited analysis possible with the lean quantitative results but holistically, the intervention group findings indicated that their empathic behaviours increased while the control group's did not, which was supported by the ERF preintervention and

postintervention ratings increased scores as well. The video intervention appears to have led to a more accurate self-rating of empathic behaviour among participants, a change that the qualitative findings expanded on in much more detail. Another possibility here is that the participants may require much more time to practice and generalize their learning before their own perception or opinion changes about whether or not empathy is really an important social skill (Blair, 1996; Grant et al. 2005; Lovaas et al., 1973; Scrambler et al., 2007). Perhaps with a larger sample size and longer intervention period the impact may be evident in descriptive statistics. It may even be the case that perception won't ever really change, but that is not necessary to build and apply knowledge of empathic behaviour in social situations. This is in keeping with the literature discussed in the earlier part of the study, as there may be a complete lack of understanding about why empathy is important. Knowing that or why empathy is important is not the target here, but learning how to act empathically in social situations by using an intervention that incorporates ABA technique (Reindal, 2008; Spink & Heinström, 2011; Welch et al., 2009). The goal was not to increase higher order thinking skills but to change an undesirable behaviour (not acknowledging the feelings of others) to a more desirable one (acknowledging the feelings of others).

When explored participant by participant, a number of participants in the intervention group showed increases while others reported the exact same results. That no students went down in ratings of frequency or importance of empathic behaviour points to the possibility that video modeling may have had a positive impact on teaching empathic behaviour strategies to individuals with ASD. The findings suggest that awareness of empathy may have increased among the participants of the intervention group and qualitative analysis confirmed behaviour change during the course of the study.

Specific items stood out in the quantitative results for both groups, and a pattern quickly emerged that hints at the impact of structured learning and video modeling. The items with the highest ratings among both groups were items 6, 5, and 1 and included smiling, waving, and nodding, telling others when they do a good job, and saying nice things. Arguably these are the easiest behaviours surveyed to learn and exhibit and the link with motor empathy being an inherent component of empathy and also the most reactionary and concrete type is supported by these initial findings (Bauminger & Kasari, 1999; Spink & Heinström, 2011; Welch et al., 2009).

Item #4 was the highest ranked among members in the control group. This item was listening to peers; one of the courses the students were taking at the time was a general learning strategies course that focused around peer interaction, and the entire course was designed to build these skills. In particular, an activity called cheers and fears was taking up most class time and involved sharing things that were good and things that were bad with peers and commenting and encouraging others as they share as well. This increase is evidence that direct teaching and structured practice can lead to applying knowledge in scripted situations.

The preintervention survey from the intervention group also had additional intriguing results, as item 8 had to do with standing up for others and was not an item that stood out in the control group findings. This may be correlated with or explained by the school-wide initiative around bullying awareness that occurred during the fall of 2011 during time of data collection. There were a series of activities in the school, including a guest speaker, focused curriculum, and movie screenings that focused on what bystanders should do when they witness someone being bullied. Barbara Coloroso, in her groundbreaking work, *The Bully,*

The Bullied, and the Bystander (2008) identified abilities that students must have to recognize and take a stand against bullying and highlights the pivotal role played by social skills in a teen's ability to respond in such situations.

The research site was focusing on a school-wide antibullying campaign at the time. That may explain the high score of something that is so hard for all teenagers to do; it is interesting to note that the same item had one of the lowest frequency ratings above. Perhaps it speaks to the complexity of bullying and that awareness is important but often does not necessarily lead to action. The school-wide survey may have impacted this particular item. Within the school, 20% of students reported they had been bullied due to their disability. While 65% of students claimed to have never been bullied, over 50% said they had witnessed another person being bullied. The school has been working on raising awareness of what constitutes bullying and how students can be better prepared to report incidents. From a school perspective, nearly 30 % cited bullying as a normal part of growing up and that the majority of students reported that they "walked away" when they saw someone being bullied (Appendix F.5). Upon examination, there was more of a mix of differences between postintervention importance rating totals than in the preintervention surveys among the intervention group, which points to the possibility that participants learned about empathy from the *MMK Friendship* videos. Individual participants rated themselves differently, and this variance can be interpreted as developing a personal awareness of empathic behaviour. As the participants ranged in age and level, variance displays not only the range of ASD among participants (high functioning to profound) but also their personal levels of self-awareness.

Despite limited support from the quantitative data to prove impact, qualitative data uncovered rich evidence of various types of empathy evident in student behaviour. The themes that emerged using specific examples in the qualitative findings section included: including others, showing interest in peers, empathy of the highest level, body language awareness, compromise, and friendship, and these were instrumental in supporting evidence of impact of the video modeling intervention. Regardless of whether or not students themselves reported an increase in empathic behaviour or importance during the study, the volume of observational data in these areas is of vital importance. The observation logs, collectively outlined with specific examples and excerpts in the results section, demonstrated that students recognized, repeated, and later (in some cases) began to apply the new knowledge of empathic social skills, most significantly Deborah and Jennifer who also had the highest increases in quantitative findings, but also other participants who demonstrated marginal or no change in their views of empathic behaviour.

Other examples showed more direct mimicking of what was shown in the videos, such as Harry moving his chair over and partnering up with someone alone or Jeffrey on seven occasions inviting others to join him in various activities. In some cases the invitations were much more scripted and mimicked the videos but, perhaps, with increasing practice in social situations, there will be more generalized and natural applications when it comes to including others. Similarly, in the case where Terry saw someone else feeling ill and expressed that he felt sick, it was clear that he saw the emotion, identified with it, and then mimicked it, which showed recognition of emotion. He did not necessarily act in a manner that demonstrated his recognition. Regardless of whether or not participants increased their own frequency or importance ratings over the course of the study, there was an impact noted

among those observing their behaviours of specific instances where a direct connection was made to the videos in the intervention. For example Harry and Robby, two participants who demonstrated negligible or no change throughout the study in the quantitative data analysis phase, were observed as being highly engaged during the intervention, which is something that was not made evident in the statistical analysis phase. The qualitative data gave far more insight into the impact and the way that behaviours changed during the course of the study, which was necessary to answer the first research question. In the instance where Jennifer recognized that someone else looked sad, she recognized that and displayed emotional empathy, which is powerful despite happening in hindsight in this case. Perhaps in the future the response will come in the moment rather than in retrospect,

The themes that emerged from the observational data confirmed the idea that empathy permeates all types of social skills. The behaviour of the participants and their personal experiences with themes of inclusion, showing interest in peers, displaying high levels of empathy, reading body language, showing compromise, and developing friendships were the areas that forged a new perspective in moving students with ASD beyond viewing the world through only their own feelings and emotions (Laugeson, 2012). The discussion of the following research questions highlights the impact on individual student social behaviour during the course of the study. The qualitative data in the previous chapter gave significant examples of occasions where students independently mimicked language from the video and often made the connections explicitly between how they acted towards another and specific video contact. The sheer number of references to pronouns showed that the participants were moving toward learning to understand others and they were not all “I” statements that were recorded. This supports the theory of moving from an egocentric perspective to a more

allocentric view where the feelings of others are factored in. The fact that participants were observed reflecting on their own behaviour but also the feelings of others shows that teens with ASD have not only the capacity to view situations allocentrically but also that targeted interventions and the opportunity to reflect on and discuss social situations is a platform for encouraging this move to a more social view in everyday interactions with peers. Perhaps it is possible for the higher order thinking skills needed to change the perspective of a teen with ASD through structured, targeted interventions.

Finding a way to move individuals on the spectrum from an egocentric to more allocentric worldview has been largely overlooked based on the "inherent lack of empathy." However, the findings of this study show that ST may be a way to teach empathy and thus change the worldview of individuals with ASD. Practice, indeed, may lead to a change in social interactions and displays of empathic behaviour. In the end, the situations of empathic behaviour that were noted displayed generalization of social learning and, further, participants began to move from an egocentric view in which they act solely for their own benefit. The implementation of the videos did impact their empathic behaviour and they were observed mimicking and making connections to the videos in generalized social situations. The qualitative data brought to light the start of a shift toward an allocentric view for some participants that leads one to hypothesize that this will continue as the empathic learning from *MMF* continues to be applied in more and more social situations (De Vignemont & Frith, 2007; Eisenberg, 2006; Eisenburg et al., 1996; Golan & Baron-Cohen, 2006; Rao et al., 2008; Wang & Spillane, 2009) .

(b) In what ways does employing a video modeling simulation intervention using the *Model Me Kids Friendship* program enhance the ability of adolescents with ASD to demonstrate empathic behaviour*?*

Although there was no overall significant change noted in statistical analysis, quantitative date did suggest that certain behaviours did increase among the intervention group when particular items are examined. The intervention appears to have enhanced the ability of participants to demonstrate empathic behaviour, as quantitative findings showed increased perception of motor empathy (more reactive) type behaviours among the intervention group. Whereas the control group showed very little change in terms of their own ratings of their behaviour, the intervention group, by comparison, increased during the timeframe of the study.

Items 6, 5, and 4 were the highest rated items; arguably, the control group of students appear to have learned to listen to others and show some degree of interest. These items may be easiest to show or exhibit as they are more of an automatic response (motor empathy) that does not require thinking about someone else's emotions or choosing an appropriate response (cognitive or emotional facets); (Bauminger & Kasari, 1999; Spink & Heinström, 2011; Welch et al., 2009). The items were: smiling, waving, and nodding at others, listening to peers when they talk about their problems, and telling another person when they have done something well. These items gauge more motor empathy responses—a response without significant thought as to the feelings of another. Item 6 was the most consistent in all ratings, as smiling and waving are the easiest to observe and measure for both students and ERFs. When the control group is examined case by case there are some interesting findings. Of the 20 cases, 7 stayed the same. However, as many participants had

lower scores in the postintervention survey when compared with their preintervention surveys as those who exhibited increase in the postintervention survey scores.

Certain behaviours stood out as showing an increase in the intervention group; items 5, 1, and 6 (with average ratings between 10 to 12) had the highest preintervention frequency scores while all other items were scored between 7.5 to 9. These items are: telling other people when they have done something well, saying nice things to others when they have done something well, and smiling, waving, and nodding at others. The two first items are so closely phrased on the SSRS that there it may have been hard for participants to distinguish between them. One item is phrased "student says nice things to others when they have done something well" and the other is "student tells other people when they have done something well." It was noted with interest that there was very little variance between the other item among the participants in the intervention group in the preintervention survey results, which was similar to those that were highlighted as motor responses in the quantitative findings section. The three items that stood out with highest ratings were the ones that participants perceived that they did regularly.

The two highest rated items in the preintervention survey were telling someone else they did something well and smiling, nodding, and waving. These two particular items are the more automatic of those on the SSRS learned response items on the survey and thus support the theory that motor empathy is a vehicle to teach more complex forms of empathic behaviour skills. Item 2 was that participants "try to understand the feelings of others"; the high rating of this item in the preintervention survey can be interpreted as evidence that the participants actually, intrinsically try to understand the feelings of others. The item did not ask if they did actually understand those feelings but simply that they try; it appears that the

participants perceived that they frequently do try to understand the feelings of those around them. This provides support for Reindal's (2008) theory, discussed at length in the theoretical framework, that having knowledge of the mental states of others does not guarantee one will employ that knowledge in order to act in an empathic manner. It may be more of an issue of successfully interpreting the feelings of others rather than factoring the feelings of others in when explaining the "empathy deficit" among individuals on the autism spectrum. This finding does not support the "inherent empathy deficit" that is universally and categorically used to define ASD (American Psychiatric Association, 2000; Kanner, 1943; Waterhouse, 2000; Wing, 1993).

The lowest rated items in the preintervention survey for the intervention group were items 6, 9, and 1, all with scores well below 8 as the item mean ratings for the frequency of behaviour among participants. These items, which were student talking things over with peers when there is a problem and saying nice things to others when they have done something well, were meant to gauge more concrete, direct behaviours that include smiling and speaking to peers in specific situations. It is revealing that the participants appeared aware that they do not exhibit these behaviours often or regularly. There is an awareness of personal behaviour in relation to those around them. These findings indicate that there is a disconnection between concrete and abstract examples of empathic behaviour. In the end, it may be the attempt to understand emotion in others that is the most important and not necessarily that those emotions were interpreted correctly.

Items 4, 6, and 8 were the highest rated in terms of frequency in the postintervention survey, with the intervention group having mean scores between 14.04 and 13. It is interesting that item 6 was also high in the preintervention as well (it involves smiling and

waving to others). However, item 8, which focused on standing up for someone who is being picked on and listening to others, showed the largest increase which again is the item which involved standing up for another person who has been unfairly criticized which was earlier connected to a school-wide campaign to raise bullying awareness discussed above. In the end, item 4, which was listening to others, showed the most drastic increase but was also not deemed a frequent behaviour in the preintervention survey. Many of the videos in *MMK,* such as the ones around rejection, showing interest, and maintaining friendship to name a few, focus around listening to others and was indeed a common thread among all the videos. The videos collectively highlighted the important skill of active listening, so there was direct correlation between an increase in the frequency rating of item 4 and a particular video and theme evident in *MMK Friendship*. The other two, which were smiling and waving and standing up for others, were consistent with highest scored items in the preintervention surveys and were attributed to motor empathy responses that are easiest to observe and require much less thought on the part of the participant.

Items 8, 3, and 4 were the highest rated in terms of the importance of empathic behaviour in the postintervention survey; item 8 was still the highest rated but did not display the largest increase. The item with the largest increase was item 3, which involved asking friends for help with problems. Both of these items were highlighted in the preintervention survey as well as in the postintervention survey. However, two other items similarly increased: listening to peers (item 4) and telling others when they have done something well (item 5). These were highlighted in many of the videos that focused around showing interest in others and maintaining friends (such as videos #8–10).

Another item warranting discussion included smiling and waving and again scored high in terms of importance, and asking for help from others also had high ratings as well. These two last items were the simplest and most self-serving items on the survey and bring awareness to the early manifestations of empathic behaviour and individual participants' perception of the importance of empathy in the initial phase of the study. Further, they point to an existing level of motor empathic behaviour among participants. Also, these items were the most inline with motor empathy and show more automatic reactions to the plights of others, which confirms the importance of motor empathy as a vehicle for building other, more complex empathic behaviour but likewise explains the consistency between both groups in the results for these items.

The qualitative data provides insight into the high scores granted to behaviours involving motor empathy in the SSRS results. The observation log provided evidence of the complex relationship between empathy, simulation, and theory of mind among teens with ASD. This complex relationship may be what limited the change noted in the quantitative analysis. However, the sheer volume of examples in the results section that testified to students incorporating the content video in social situations shows that they were able to simulate the situations and enhance their ability to react with empathy towards others. In the observational data that were coded under the theme of empathy of the highest level, there were many references in the data to this theme but all those references came from only four participants (some on more occasions than others), and that fact should not be overlooked. Although these participants were not necessarily the ones who showed the greatest gains in terms of empathic behaviour frequency or perception of importance, it is highly plausible that although their perceptions did not change, their observed behaviour did change. As

outlined in the literature review, the basic idea behind ToM is that individuals with ToM are able to understand and predict the actions of others while those who do not have ToM cannot (S.A. Johnson et al, 2009; see also Astington, 1990, 1993; Baron-Cohen, 2001; Doherty, 2009). Many researchers have made the interpersonal process connection between empathy and ToM inextricable and explicit, arguing that understanding your own mind is pivotal to understanding the minds of others (Goldman, 1993, 1995; Hobson, 1993; see also Blair, 2005; Gillberg, 1993; Melzoff & Gopnik, 1993; Perner, 1993). Such views have developed into a discourse leaning towards the supposition that "putting oneself in someone else's shoes emotionally and cognitively seems to rest on the equivalence between self and other" (Meltzoff & Brooks, 2001, p. 189).

However, the samples discussed in the results chapter draw suspicion on the accepted interchangeability of ToM and empathy and supports arguments that there needs to be much more distinction between cognitive empathy and emotional empathy in terms of individuals with ASD. Cognitive empathy (the ability to take another's perspective) is inherently tied to ToM, but emotional empathy (choosing the appropriate emotional response), many argue, is not (Rajendran & Mitchell, 2007; Rogers et al., 2007). The volume of examples outlined in the qualitative results section calls into question how important it is that an individual with ASD understand his/her own mind in order to show empathic behaviour. This was also called into question in the discussion of the quantitative findings. Whether an individual with ASD feels empathy is not the observable behaviour exhibited in any of these cases; the evidence shows that empathic behaviour can be demonstrated, with motor reactions and practice, without feeling the same way as the other person.

For participants, learning how to act and react in certain situations did not require that they necessarily understand the way others feel or require feeling the same way. The findings confirm the argument outlined in the theoretical framework that although individuals with ASD may not demonstrate cognitive empathy, they may learn and apply emotional empathy (Spink & Heinström, 2011; Welch et al., 2009). Again, the complicated relationship between theory of mind and empathy can be clearly understood through the lens of what Reindal (2008) deemed as a "necessary and sufficient distinction" (pp. 143–144). Basically, a *necessary condition* is defined as a prerequisite; in this case one must have ToM to be able to feel and act empathically. In spite of this, ToM is not always a *sufficient condition* because it is possible to have ToM but not act or feel empathic towards others. Thus, having knowledge of the mental states of others does not guarantee one will employ that knowledge in order to act in an empathic manner.

The qualitative examples that were coded under empathy of the highest level embodied the high level of analytical skills the individual must apply for social learning to transfer into generalized interactions in naturally occurring social situations. For example, Herald's request for a cue card for body language demonstrated self-avocation and his internal motivation to apply and generalize the information in new social situations. Further, this particular example shows the crossover between ABA and simulation theory. The reason video modeling is effective with children with ASD is because it is highly visual, forces a restricted field of focus, and also avoids face-to-face attention. ABA seeks to change behaviour by either decreasing undesirable skills or increasing desirable skills and centers around providing structure and routine in an effort to generalize new skills (Geneva Centre for Autism, 2007; Perry & Condillac, 2003). Herald had advocated for an additional

visual tool to help him remember the strategy in the video so that he could revisit it and have it with him. Knowing that or why empathy is important is not the target here, but learning how to act empathically in social situations by using an intervention that incorporates ABA technique. The goal was not to increase higher order thinking skills but to change an undesirable behaviour (not acknowledging the feelings of others) to a more desirable one (acknowledging the feelings of others). Shawn was writing a journal and reflected, "I have learned that everyone has feelings. I need to remind myself to stop and look at others. There is a way to notice that I think I am learning." This stood out as the most insightful of the contextual examples as it served as a participant validating the intervention and giving credit to the success of simulation interventions that are systematized and allow for practice as many times as an individual needs.

The instance of Deborah feeling left out in the cafeteria showed that she did not want to be lonely but was scared of being rejected. Her feelings confirmed Bauminger and Kasari's (2000) findings that children with ASD are lonelier than their peers and not only recognize that they don't fit in but, further, feel rejection. This example also confirms the peer relationship difficulties that cause frustration, anxiety, and confusion among these adolescents, as Deborah was lonely but would not initiate interaction for fear of being rejected (Church et al., 2000). She was frustrated and also confused; she didn't seem to make the connection that she would continue to be lonely because she feared rejection and would not go and join a group in the cafeteria at lunchtime. In another instance, when Deborah told a peer, "you are such a good friend. Thanks for helping me. I really needed it" she not only modeled the video on maintaining friendship but also demonstrated a deeper awareness of social nuances than would be expected if individuals with ASD completely

lacked ToM. She was able to apply the skills modeled in the video and mimic the dialogue in the video in a different context, showing empathic behaviour in all its complexity (emotional, cognitive, and motor).

When viewed within the social development model studies of the phenomenon of ASD, the argument made by Smith (2006) that empathy is typically developed through socialization may also apply to this unique group of individuals. The notion that individuals learn how to apply social behaviour through observation, imitation, and modeling is clearly reflected in these instances of behaviour (Bal et al., 2010; Bons et al., 2010; Spink & Heinström, 2011; Welch et al., 2009;Wright et al., 2008). There are all three factors evident in the above examples, with some participants displaying one type while others show all three. Simplistically speaking, emotional empathy is used to reference the experience of emotions that are consistent with the situation and in response to those of peers. The complexity of empathic behaviour is demonstrated below with a few notable examples from the sample of qualitative data collected.

Most powerful, the example of Shawn using strategies in the video to get over conflict and talk about what was upsetting him showed that he had explicitly recalled, practiced, and generalized the material in the video and found that he was rewarded for his appropriate empathic response with his friend. For example, when Shawn recalled he would call his friend when he got home and try the strategies he had seen in video #3 so they could get over their conflict, he had explicitly recalled, practiced, and generalized the material in the video and used it in a friendship situation. Shawn's treatment of a student with a physical disability demonstrated that he was able to recognize the unfair treatment of his peer and also tried to understand what that would feel like. This was an example of a

reactive empathy that was completely appropriate for the situation. Not only was the participant able to choose the right response (and thus employ emotional empathy), he was also able to explain the reasons that he felt the way he did. Simulation theory was used in the video modeling technique and thus highlighted the interplay among all the various forms of empathy.

Again this provides support to the idea that actually understanding the feelings of another on a deep level is not necessary to show empathic behaviour and respond appropriately in social situations. With the structured learning inherent in the *MMF* videos, the hypothesis could be made that they were better able to accurately rate their own behaviour based on their newfound knowledge of empathy. These examples highlighted the ability that teens with ASD have the ability to "put themselves in someone else's shoes," which is contrary to commonly accepted theory. As the literature review uncovered, the assumption that all individuals with ASD cannot be taught to feel or show empathy is not accurate. The instances of empathic behaviour noted during the study support the argument that ToM abilities can develop through time; despite an initial struggle to understand the emotions of others, the potential is evidently there but is often hidden— that is not to say it cannot be taught (Baron-Cohen; 1995). Although this process appears to be more directly observable and not as much of an internal process, it is there. The behaviours noted confirm Hobson's (1993) claim that in order to acquire knowledge of the nature of people's minds, one must be socially engaged with others, as all examples involved social interactions with peers.

Temple Grandin's (2006) reflection that she has a "process of using intellect and logical decision making for every social decision. Emotion doesn't guide my decision; it is pure

computing" was evident in the observational samples as well (p. 103). Grandin's experience draws attention to the need for a logical and methodic way to teach social decisions and empathic behaviour to individuals on the spectrum, and the findings of this study indicate that video modeling, with simulation theory embedded, may provide that way for educators. The choice of *MMF* as a systematized way of teaching social skills by capitalizing on memory and the visual learning style of most individuals with ASD appears to have been a successful way to teach social skills.

Perhaps the observational data that stood out most among the participants were Shawn's reflective journal where he highlighted what he learned about the emotions of others. His attention to the feelings of others and also that he needs to remember to pay attention served as participant validation of the intervention, which was something that was completely surprising given the demographics of the study. Shawn giving credit to the success of the intervention validated the purpose of the study. In light of the observed changes in behaviour, which were largely described as intriguing, the effectiveness of the intervention was demonstrated in the instances of including others, showing interest in peers, empathy of the highest level, body language, compromise, and friendship over the 3 month data collection period.

The final theme that emerged from the qualitative analysis, friendship, shows the interplay between empathy, simulation, and theory of mind clearly. In a sense, all videos were depicting skills necessary to have friendship, which is why it is fitting that the video collection used in the intervention was entitled *Model Me FRIENDSHIP*. Arguably, friendship is one of the most challenging social areas for teens on the spectrum and the hardest thing to develop and the reason for employing an intervention to teach skills and

model ecologically valid social situations (Laugeson, 2012). Without all the social skills required to communicate in the teenage world, an adolescent with ASD really struggles to form a single lasting friendship. Friendships are uncommon among children on the spectrum, and it has been argued that this is the result of a lack of social cue awareness. Orsmond et al. (2004) concluded that only 8% of teenagers with ASD have even one friend with whom they spend time in various activities. When viewed in light of this, it is remarkable that there were noted examples of friendship forming among two of the 10 participants in the intervention group. Two of the participants in the intervention group showed evidence of forming lasting friendships, cementing the effectiveness of video modeling as a way to teach social skills—there is no area more indicative of empathic behaviour and social skills than forging and keeping friendships. In the context of teenagers, making and having friends is the definition of having social experiences.

(c) How do adolescents with ASD express or speak about their empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship*?

This research question was explored solely through qualitative data as only the observation log recorded how students expressed or spoke about their behaviour. The qualitative data overwhelmingly provided concrete evidence of simulation and mimicry. Participants in the intervention group used the content of the videos to guide their social interactions. For example, Aaron, who demonstrated increases in survey ratings, similarly seemed disinterested when watching the *MMK* videos but would later mimic what he had seen. His recounting of compromising with pizza demonstrated that he had recognized a situation that required compromise and linked it to the video. His reflection that he had been

reviewing it in his head to "remind himself to do it" shows that the information was beginning to generalize but still was only applied within the specific context of the video examples. Perhaps with more time he would be able to generalize the material from the specific examples and recall not the pizza but the steps to take and when to initiate making a compromise. Deborah similarly took in all the nonverbal and verbal material of the videos and applied it to social situations. This example demonstrated direct reflection by the participant and an understanding of the content in the videos.

Another example of the simulation process was evident when Terry appeared disinterested in the videos but was able to recount specific details of the video and discuss what happened. This brought to light a factor that must be discussed in terms of the perception; what the ERF "perceived" as disinterest, in fact was interest–it just looks different to Terry. Other participants whose overall totals dropped or stayed the same were observed, as in the case of Herald, appearing "defeated" while watching the videos. For example, on the occasion where he appeared not to be watching and looking around the room he was actually trying to "read" the body language of those around him. This particular example brings light to the fact that observable behaviour is not always necessarily indicative of the level of engagement or engagement at all. For example, it was observed that another participant "while viewing the videos, constantly touched his head and looked away from the screen. He was able to recount what happened and discuss later though."

Qualitative data brought forth the interpretation that behaviour while watching videos does not necessarily correlate with understanding of participants. Those who appeared engaged may not have connected with any of the material, and those who appeared

disinterested may have been paying the most attention and committing the content to memory. Further, higher order, analytical thinking about the scenarios presented in the videos appears to have no correlation with behaviour during the video viewing time. To take this a step further, students may have changed their empathic behaviour much more than was noted by ERF observations because sometimes appearing disinterested or disengaged was not a valid measure of level of engagement or social consciousness. This is an area that really stood out; the findings indicate that perhaps self-observation could have also been incorporated in the study.

The process of simulation outlined in the theoretical framework included echoing, attributing intention, and imagining, all of which are present in these examples (Gordon, 1995; Harris, 1992; Heal, 1995). The number of examples in the results section that demonstrated students using the phrases from the videos in social situations or referring to video content/context when interacting with others fits the important role Goldman (2001) attributed to echoing and pretending as the way to match reactions to particular situations. The instance where Harry was observed as moving his chair over to be included with others was a parallel reaction in nature because it mimicked what other students were doing but also showed internal recognition that he realized he was feeling left out. The qualitative findings of this study support ST which claims that the simulation process of pretending to be in another person's position and generating thoughts or actions attributed to the other through introspection can lead to applying complex social skills in naturally occurring settings. The relationship between motor empathy and ST is that motor empathy, in essence, is the physical response to the emotions of another person (often through mimicry). With experience, some participants took the simulation process beyond its formative state and

were able to generalize and begin to explore the mental states of others (Davies & Stone, 1995).

The video modeling technique was presented in the theoretical framework as being in keeping with Bandura's (1986) theory of observational learning. Attention, retention, production, and motivation were presented as four distinct processes involved in observational learning. The attention process is the initial act of vicarious acquisition that occurs when an individual accurately perceives a model. The attention process requires the intake of sensory stimuli and focuses on the specific task. The retention process requires the learner's capacity to process the behaviour that is modeled. Finally, retention occurs when modeled behaviours are coded internally into meaning and then stored in memory. The chances of meaning being made and transferred into memory are increased with the use of visuals, rehearsal, and role play (Corbett & Abdullah, 2005). This is precisely what happened in the case of most participants.

Although findings indicated instances of participants moving into the production process (reproducing the modeled behaviour in social situations) there was much less evidence of participants moving into the motivation stage (only by a few students detailed below). The motivational stage is where a person can see the value in the rehearsed skills and apply it without prompting. For example, on the very same day Deborah watched the video about including others, she stopped and asked someone she recognized as being alone to join. She had generalized that feeling isolated is not a good feeling and that her peer probably felt really lonely. Furthermore, Deborah had applied the strategy of stopping and seeing if anyone is alone and inviting them to join and saw that it worked. Deborah appears to have made the direct connection to the video strategy and said it "taught me about reading

other people like you read the words on a page of a book." This example demonstrates a participant paying attention to the video, retaining the modeled behaviour, and producing the appropriate empathic behaviour.

The qualitative findings of this study confirmed that with practice and imitation, the skills acquired may transfer to new situations. This example is one of many which confirmed the claim that with practice and imitation the skills acquired may transfer to natural social settings. If empathic behaviour skills are broken down and presented in a formulaic way (through video modeling) that allows for direct teaching and repeated practice, individuals with ASD can improve such behaviours (Autism Ontario, 2011; Reichow & Volkmar, 2010). The above examples lend support to the theory that video modeling simulation allow for repetition and practice, which increases chances that content will be committed to memory and possibly later generalized in naturally occurring situations.

For example Aaron's statement to the class that we have to "include everyone and no one should ever feel left out in this class. We learn how to pay attention to the feelings of others here" arguably was evidence that he had generalized the learning to the entire classroom setting. His new knowledge was applied in various situations in the observation log and showed a high level of generalization over time. These examples of empathic behaviour show precisely what studies called for as discussed in the literature review: data-driven evidence for empathic responding difficulties (Bagatell, 2007; Carruthers & Smith, 1996; Currie, 1996; Eisenberg, 2000, 2006; Glossop, 2007; Honig & McCarron, 1988; Lord, 1993; Lovaas et al, 1973; Morrison & Bellack, 1981; K. Rogers et al., 2007; S.F. Rogers & Pennington, 1991; Samet, 2003; Sigman, 1998).

(d) How do the assistants perceive the same individuals' empathic behaviour following participation in a simulation intervention using MMF?

The ERF pre/postintervention frequency ratings for participants in the control group were 6.3 and 6.2, showing virtually no change. The low mean score of ERF rating of control group participants of instances of empathic behaviour (6.2) is very telling in terms of the level of empathy observed by the ERF. The mean frequency total for ERF ratings among the intervention group was 5.2 preintervention and 6.70 postintervention, demonstrating an evident increase. Although there is an evident disconnect between how students perceive their behaviours and the way they are observed interacting with peers, that does not mean that self-ratings should not be used. There is much to learn about individuals with ASD, and the clearest route to moving in the right direction is through how they perceive themselves and feel in social situations (Vazire & Mehl, 2008). Although bias is an inherent issue, it is precisely the bias that is being sought (Koning & Magill-Evans, 2001b). The disconnection between student self-ratings and ERF ratings could be viewed as evidence of the desire to improve social interaction (Sedikides & Gregg, 2008; Swann & Read, 1981; Taylor & Brown, 1988).

The ERF ratings for the intervention group highlighted some discrepancies in terms of perception of empathic behaviour. Some scores were as low as 0 and the highest was 9 (whereas that was below the mean of the student self-ratings). For example, the student who was rated as never showing empathic behaviour on any of the items of the scale has very low verbal ability. Although he seemingly displays no observable peer interaction, his self-perception was very different and he rated his empathic behaviour at a 9 in both the pre-and postintervention surveys stating that he believes he acts with empathy some of the time.

Interestingly, none of the student participants saw themselves as "never" displaying the behaviours, but the adults who observe them every day had a completely different view of the same students. This pointed to an area for future study exploring the relationship between observations and self-perception among this group of teens.

In the ERF surveys for the intervention group, items 5, 6, and 1 were highest (the only totals with scores above 8), which is consistent with how the students scored themselves in their self-ratings despite ERFs (however, the ERFs's scoring was significantly lower on all items). These items are the same as the initial survey (telling others when they have done something well and smiling, waving, and nodding at others), with the addition of saying nice things to others when they have done something well. This may reflect that these particular items were the easiest to observe and note in someone else's behaviour without having to ask probing questions; this may also explain why they were the most frequently observed by the ERFs. There is much to be gleaned from gaining more understanding into the thought processes when it comes to empathic behaviour amongst teens with ASD. In many ways, that makes sense because, for teenagers, standing up for victims is one of the hardest things to do (school-wide data said the majority of students chose to walk away; Appendix F.5) and for these adolescents who also face constant challenges when attempting to decipher a social language they do not comprehend it is approaching impossible.

Although not directly tied to answering the question, it must be noted that all observational data discussed in the earlier research questions demonstrates that the ERFs saw noteworthy examples in empathic behaviour. Observation, in a sense, involves inherent perception and interpretation and any instances they felt worthy of recording are evidence of

how often they felt students in the intervention group were acting with empathy towards peers.

Chapter 7: Conclusions and Contribution to the Field of Education

Although the quantitative data did not show significant change in ratings of behaviour between the control and intervention group as had been anticipated, the results led to an increased understanding of the complexity of empathic behaviour among adolescents with ASD. The increased ERF scores for the intervention group did support an increase in terms of frequency of empathic behaviours. When viewed in light of the qualitative observations of empathic behaviour this points to the impact that the intervention had on individual participants behaviour. Upon analysis, the connections that the individual students made to the videos and the effect it had on their social interactions with peers support the argument that there was an impact on their behaviour. In the future, studies with a larger sample size and longer intervention period may investigate the impact further. However, it may also be the case self-ratings among the target group are not a valid indicator of the impact a strategy has on behaviour. Therefore, further investigation into the accuracy of using self-rating among teens on the spectrum must be explored before any conclusions can be made regarding the use of self-report or the effectiveness of video modeling.

The findings of this study answered the primary research question showing that the implementation of an empathy-focused video modeling intervention, adolescents with ASD has a positive impact on observed social behaviour. Findings support further investigation of the use of a targeted video modeling intervention based on the principles of ST and ABA and whether video modeling can provide teenagers with ASD a strategy to build upon and thereby increase empathic behaviour in social situations. Although statistically, the impact was not significant, the qualitative results and the increased ERF ratings among the

intervention group participants suggest that awareness of empathy was increased among the participants of the intervention group and that their individual behaviour changed during the course of the study.

When compared to the standard scores in the SSRS manual, the change noted brought the intervention group from being initially "below average" in ratings of empathic behaviour to "average" collectively. This is remarkable given that nearly all participants in both the control and the intervention groups are below average (and many well below average) in terms of general ability levels (see appendix B.7). The greatest support for the success of the intervention came from the qualitative observation data; the number of occasions and intensity of situations where the participants were able to apply their empathic learning to social interactions points to the importance of additional research into the use of *MMK* as a teaching tool. There were item specific trends that were noted among the intervention group that may show some influence but was not evidence of finite change. The qualitative data gave insight into participants' attempts at applying what they had learned in the videos to social situations and brought further support for the intervention as a successful tool to teach social skills. This study moves ST toward establishing increased validity in the notion that one uses his/her own cognitive resources to attribute the mental states of others through role-play and scenario viewing. This finding does not support the "inherent empathy deficit" that is universally and categorically used to define ASD. Perhaps we have been looking at empathy through too narrow a lens and defining it as "cognitive" or "emotional" when in reality it involves both plus the motor facet. Some participants did begin to show marked change in qualitative data.

The ultimate finding was that with time and structured practice, skills needed to act with empathy can generalize to naturally occurring social situations. The two highest rated items in the preintervention survey were telling someone else they did something well and smiling and waving. In the statistical findings it was the more "motor" empathic behaviour responses that were targeted but the qualitative data collected provided an alternate, personal facet. It was the emotional and cognitive facets of empathy that were observed, probed, and reflected on in the observation logs, allowing them to be factored into analysis. These two particular items are the more automatic of those learned response items on the SSRS and thus support the theory that motor empathy is a vehicle to teach more complex forms of empathic behaviour skills. Indeed qualitative findings indicate that experience does play a formative role because, through practice and social interactions, the cognitive resources are improved. This can lead to application and generalization in naturally occurring social situations; the younger motor empathy can be taught the better for developing social skills as children grow. Despite minimal change noted statistically the qualitative data supports the argument that individuals on the spectrum can learn empathic behaviour through video modeling but may require much more time to practice and generalize their learning before their own perception or opinion changes about whether or not empathy is really an important social skill. Their behaviour began to change but their own perception of that behaviour or empathy may not reflect the effectiveness of video modelling.

The employment of a video modeling simulation intervention using the *Model Me Kids Friendship* program enhanced the ability of adolescents with ASD to demonstrate empathic behaviour providing an invaluable insight into the role perception plays in behaviour observation. When viewed in relation to how the assistants perceive the same

individuals' empathic behaviour following participation in a simulation intervention using *Model Me Kids Friendship,* a new perspective of empathy theory was confirmed. In the end, qualitative data supported a shift in participants to asking "is this what I would do" about another's behaviour. There were numerous examples of students applying the concrete steps for the social skills shown in the specific videos in natural settings. Even more remarkable were the observations where students were reflecting on their own situations in relation to the *MMF* videos and then choosing which steps to apply to get the appropriate reaction from their peer group.

The themes that emerged from the observational data confirmed the idea that empathy permeates all types of social skills. The observed behaviour of the participants within the themes of inclusion, showing interest in peers, displaying high levels of empathy, reading body language, showing compromise, and developing friendships forged a new perspective in moving students with ASD beyond viewing the world through only their own feelings and emotions. Exploring interventions to increase allocentric perspectives among individuals with ASD requires more research attention. ST may be a way to teach empathic behaviour and in doing so may change the worldview of individuals with ASD.

Exploring the research questions and interpreting results increased understanding of the complexities of self-concept of participants. The limited change in the preintervention and postintervention ratings on the SSRS empathy scale again raised the argument of whether or not it is necessary that one understand the emotions of another person in order to act with empathy. Instances of empathic behaviour that were noted in the observation log were direct application of explicit skills taught and modeled in the video intervention rather

than the development of an internal, naturally occurring mental process of "putting yourself in someone else's shoes."

By beginning to apply a learned (through practice, modeling, and simulation) set of social rules for acting empathically, participants began to apply those and reflect on the process. The qualitative findings confirm the argument outlined in the theoretical framework that although individuals with ASD may not demonstrate cognitive empathy, they may learn and apply emotional empathy (Spink & Heinström, 2011; Welch et al., 2009). Reindal (2008) argued that ToM is not always a *sufficient condition* because it is possible to have ToM but not act or feel empathic towards others. Thus, having knowledge of the mental states of others does not guarantee one will employ that knowledge in order to act in an empathic manner. By extension, one can learn to act in a particular way in a specific situation without making the leap to understanding someone else's mental state but rather through structured learning and practice.

The examples that arose from the various themes highlight the high level of analytical skill that is required for individuals with ASD to transfer social skills learning into generalized interactions in naturally occurring social situations. With the structured learning inherent in the *MMF* videos, the hypothesis could be made that they were better able to react in social situations with their newfound knowledge of empathy but that that knowledge had not yet transferred to how they perceive their own behaviour or the importance of empathy as measured by the SSRS (Kalyva, 2010; Kavalam, 2007; Vazire & Mehl, 2008). Observed situations of empathic behaviour that displayed generalization of social learning brought the idea forth about whether or not participants began to move from an egocentric view in which they act solely for their own benefit. The qualitative data raised the potential for a shift

toward an allocentric view for some participants that leads one to hypothesize that this will continue as the empathic learning from *MMF* continues to be applied in more and more social situations (De Vignemont & Frith, 2007; Eisenberg, 2006; Golan & Baron-Cohen, 2006; Rao et al., 2008; Wang & Spillane, 2009).

In the future, research with larger numbers of students and a longer treatment period could explore whether or not there was an impact evident in statistics. Perhaps additional study exploring the complexity of empathic behaviour among adolescents with ASD will bring further support for the use of interventions based on the foundations of ST and ABA with this unique group of adolescents. The findings of this study may inform future work in the field of teaching care, cooperation, assertion, and developing friendships and thus enrich the social lives of individuals living with ASD. This draws attention to an area for future study exploring the relationship between observations and self-perception among this group of teens.

Contribution to the Field of Education

Many researchers in the field of ASD have made the heartfelt claim that people with ASD have the greatest difficulties "on the playground, in friendship, in intimate relationships, and at work, where the situation is unstructured, unpredictable, and where social sensitivity is needed" (Baron-Cohen, 2002, p. 253). As a result, it is crucial that future researchers seek to understand the reality of day-to-day interactions and thought processes of individuals with ASD by applying ToM and empathy theory in practical interventions. This project was aimed at that, and the findings indicate that individuals with ASD are, in fact, able to recognize the emotions of others. That ability can, through direct instruction employing video modeling, lead to increased empathic behaviours towards peers. In the

poem “Build Me a Bridge,” Thomas McKean (1994) called for assistance in learning empathy from those who are “part of another world and I will never know what it's made of. Unless you build me a bridge” (pp. 36–37).

Strategies that facilitate the transferability of social skills are paramount in forming a bridge for individuals with ASD because they face immense challenges in comprehending the minds of others. Within the field, this study’s intent was to determine if a specific, targeted video modeling intervention would increase the ability of teens with ASD to act empathically. In light of the positive findings, this study has added support to a modeling intervention that largely lacks research validation. Additionally, the study has increased the understanding of the complexity of empathic behaviour among this group of individuals and supports the power and appropriateness of using self-reporting and video modeling in future studies to delve deeper into the phenomenon of empathy. This study found that teenagers with ASD may have more ability to empathize than a survey of seminal research in the field would uncover, and much more research is needed in this particular area to fully understand the complex relationship between empathy and individuals with ASD. Additionally, the information gleaned from self-ratings and ERF ratings requires further investigation into the use of self-reporting of empathic behaviour (motor, emotional, and cognitive facets) among the adolescents with ASD.

Simulation theory, and video modeling specifically, were confirmed as frameworks for providing a practice-based pragmatic approach that may increase this ability to transfer learned empathic behaviour to social situations. Recent research has similarly suggested that practice does, in fact, lead to improvement, and this study confirms that structured practice is effective among this unique population. This study confirmed the postulation by

simulation theory that people move from knowledge of their own mind, to wondering, reproducing, or matching what is happening to others. The qualitative observations showed a plethora of examples where this is precisely what occurred during the course of the study for participants in the video intervention group (Davies & Stone, 1995; Golan & Baron-Cohen, 2006; Heal, 1995; Klin et al., 2006; Robinson, 2008; Wang & Spillane, 2009).

Simulation theory, thus, can be a teaching vehicle for building capacity for empathic behaviour among teens with ASD who struggle to socially interact with peers and form friendships. With the positive presentation of *MMF* videos, students were engaged and motivated to try newfound strategies. Upon study completion, the lead teacher in the program reported that many of the students used free time on the computer to view the videos without prompting. This points to the power of video modeling as a form of explicitly teaching social skills to students who struggle in peer interactions. The ultimate goal for educators is to emphasize the learning, generalization, and maintenance of appropriate behaviours through the use of video modeling. With the structure provided by video modeling (incorporating the foundations of simulation theory, visual learning theory, and ABA techniques), individuals with ASD may become better equipped to identify and react to the plights of others in natural social settings (Fabes et al., 1994; Izard et al., 2001).

Beyond being easily reproduced in future studies, the findings of this study are important to those who work with individuals with ASD, providing examples of when, why, and how to use video modeling to build empathy with students. Despite the emphasis placed on covering immense academic curriculum in Ontario schools, it is imperative that time be carved out for teaching social skills. Video-scene modeling can be easily incorporated into classroom teaching and resource support programs with little difficulty, making it easily

applicable to mainstream education. In particular, there are immense benefits to using *MMF* as a means of differentiating learning for individual students on the spectrum who do not necessarily struggle in the same social skills areas or social environments. As students learn at different rates, video modeling allows for individual skill refinement, allowing for more students to have targeted social skills training when there is only one educator present.

Perhaps, as result of this study, departmental policy and board services will promote the use of video modeling as a means to develop social skills and allocate adequate funding for the purchase of video modeling programs to be used in meeting the educational and social needs of adolescents with ASD. Video modeling, and the *MMK* program in particular, are a time-and cost efficient way for educators to program for and develop social skills goals for the students they work with. With the increase in technology in schools in Ontario and the lower costs of computers, video modeling systems can be easily integrated into classrooms as an affordable intervention. By showcasing specific intervention strategies among programs, educators and ERFs can share effective practices. Currently, there is a lack of curriculum and strategies to address the social skills needs of students with ASD. There have already been a number of schools in the board inquiring about the results of this research project and inquiring about the cost and structure of *MMK* in the hopes of purchasing for their own programs. Given that a deficit in social skills, and empathy in particular, is a defining characteristic of ASD, the benefits of this research are monumental for participants. As the intervention was proven successful with this group of students, a practical classroom method has been validated that is easily available to teachers, parents, and individuals with ASD.

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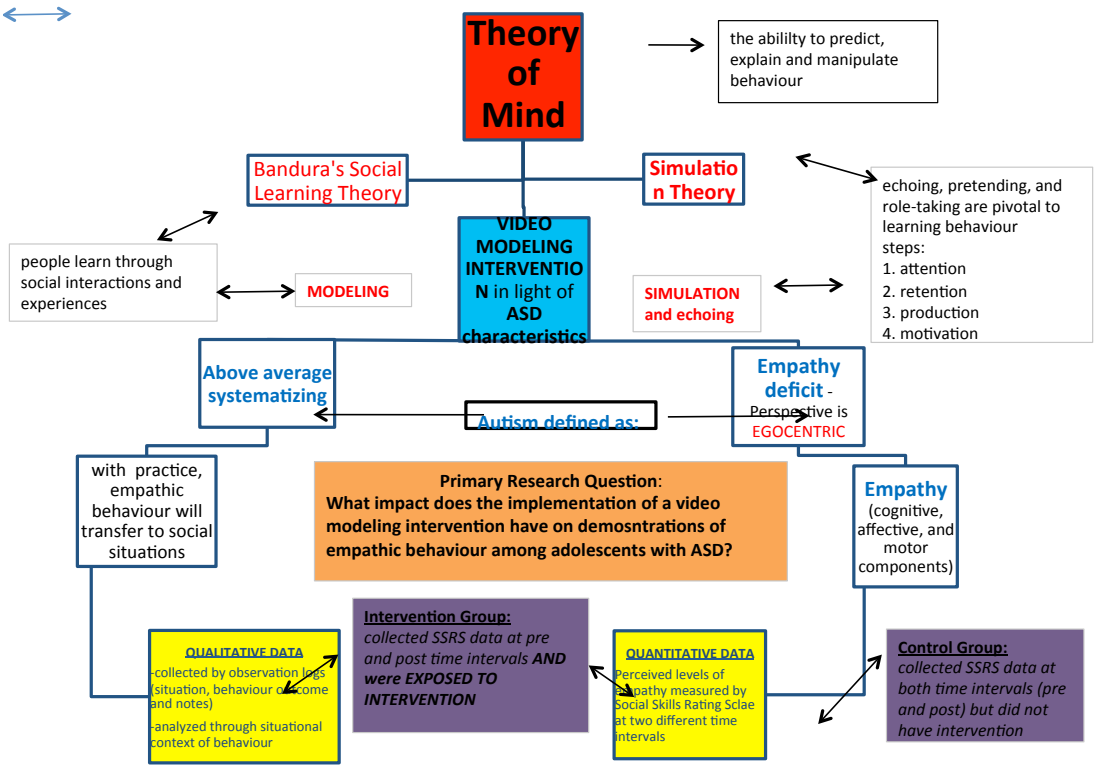
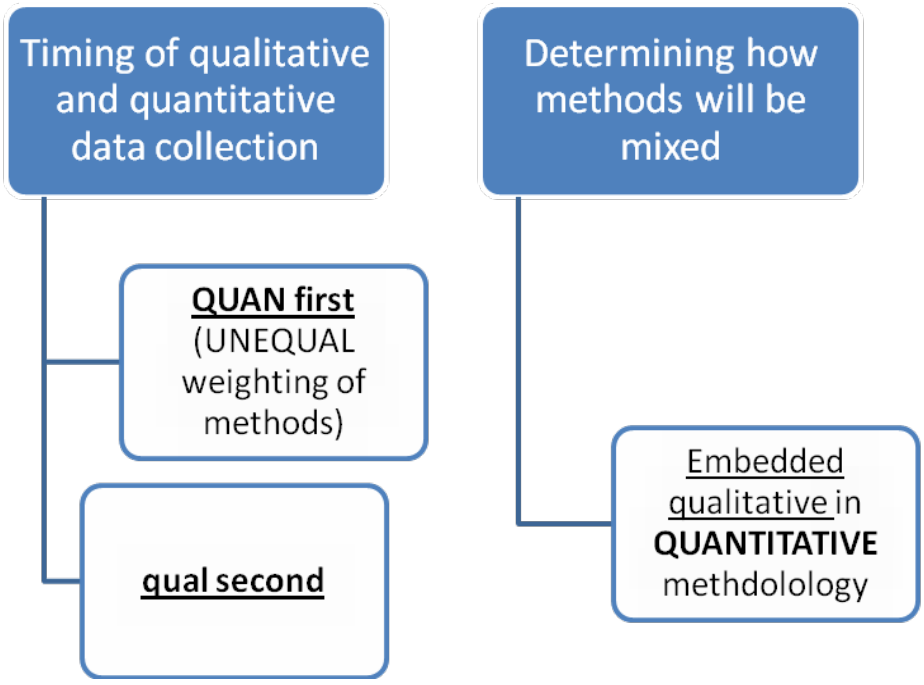

Theory of Mind
the abililty to predict, explain and manipulate behaviour
Bandura's Social Learning Theory
Simulation Theory
echoing, pretending, and role-taking are pivotal to learning behaviour
steps:
1. attention
2. retention
3. production
4. motivation
people learn through social interactions and experiences
MODELING
VIDEO MODELING INTERVENTION in light of ASD characteristics
SIMULATION and echoing
Above average systematizing
Autism defined as:
Empathy deficit - Perspective is EGOCENTRIC
with practice, empathic behaviour will transfer to social situations
Primary Research Question:
What impact does the implementation of a video modeling intervention have on demosntrations of empathic behaviour among adolescents with ASD?
Empathy (cognitive, affective, and motor components)
QUALITATIVE DATA
-collected by observation logs (situation, behaviour outcome and notes)
-analyzed through situational context of behaviour
Intervention Group:
collected SSRS data at pre and post time intervals AND were EXPOSED TO INTERVENTION
QUANTITATIVE DATA
Perceived levels of Empathy measured by Social Skills Rating Sclae at two different time intervals
Control Group:
collected SSRS data at both time intervals (pre and post) but did not have intervention



Embedded experimental model based on Creswell & Plano Clark (2007, p. 67)