

Theory of Mind in Autism Spectrum Disorders:
A Case Study Describing an Intervention to Teach ToM Concepts

by

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Abstract

Individuals with autism have been shown to have specific delays in the development of a theory of mind (ToM), which refers to the process of attributing mental states to self and to others in order to explain and predict behaviour. The overall purpose of this project is to provide an accessible account of a multi-year intervention, based on strategies consistent with applied behavior analysis (ABA), designed to improve the social development and theory of mind functioning of an 11-year old male student with autism spectrum disorder. An ethnographic account introduces readers to Kenny, a boy diagnosed with autism, and provides the context for understanding how the intervention was individualized to both consider his strengths and to address his needs.

Based on the analysis of interview, questionnaire, and direct observational data obtained during a three week study period, four themes emerged as significant for reporting on the participant's development. First, findings support the conclusion that it is critical for ToM interventions to be tailored to individuals in order to maintain motivation and ensure participation. Second, data supports that through the use of ABA techniques, the participant was able to develop social language skills, such as asking Wh- questions. Third, data supports the finding that Kenny's peers enjoyed participating in the intervention activities, and that in many ways, they became his social teachers. Fourth, data supports that Kenny displayed meaningful improvements in his social development, and theory of mind functioning, after participating in the intervention. Specifically, interviewees observed dramatic increases in (a) his level of social awareness, and (b) the frequency of his social interactions with peers. Recommendations are made for educators who may be considering incorporating ToM programming for their students with ASD.

I dedicate this work to Kenny-

Thank you for teaching me, and for making me strive to be a better person, each and every day.

Let the child teach you about what the child needs and what you need to do....and that your interaction be an ongoing process between you and the child and NOT some recipe you have predetermined you are going to use.

Dr. Vincent J. Carbone

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Feelings of worth can flourish only in an atmosphere where individual differences are appreciated, mistakes are tolerated, communication is open, and rules are flexible - the kind of atmosphere that is found in a nurturing family.

Virginia Satir

Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
CHAPTER ONE.....	1
INTRODUCTION TO KENNY AND HIS INTERVENTION	1
Autism Spectrum Disorder (ASD).....	2
Theory of Mind as a Core Deficit in ASD.....	5
Applied Behavior Analysis and ASD	6
Purpose of the Project.....	8
Timeline of the Project.....	10
Who We Are: An Ethnographic Introduction.....	11
CHAPTER TWO	23
REVIEW OF THE LITERATURE	23
The Theory of Mind Model	23
Factors Affecting the Teaching of ToM Skills to Those with ASD	29
CHAPTER THREE	42
METHOD	42
Focal Participant	42
Peer Participants.....	43
Interview Participants	44
Materials	45
Study Design.....	48
A Sample Day.....	48
Analyses.....	63

CHAPTER FOUR.....	64
FINDINGS AND DISCUSSION.....	64
Theme One: Motivating Kenny to Learn About His Peers.....	65
Theme Two: Giving Kenny Language Skills for Learning About His Peers	66
Theme Three: Peer Perceptions About Their Interactions with Kenny	69
Theme Four: Adult Perceptions Regarding Kenny’s Social Development	71
Limitations of the Project	75
Recommendations for Practice	76
References.....	79
Appendix A.....	83
Appendix B.....	86
Appendix C.....	88
Appendix D.....	90
Appendix E.....	92
Appendix F.....	93
Appendix G.....	95
Appendix H.....	96

CHAPTER ONE

INTRODUCTION TO KENNY AND HIS INTERVENTION

I met Kenny in February of 2002 when I began working as his one-on-one behaviour therapist. As a young child, Kenny was diagnosed with autism. Upon our meeting, I was struck by how very hard this seven year-old boy worked. Each day, Kenny would attend a full day of school, followed by a three-hour home session as part of his applied behavior analysis (ABA) program. As I became acquainted with Kenny's home and school life, I experienced a growing sense that a beneficial next step would be to target Kenny's social development. His parents and I shared this vision of a boy initiating social interactions with his classmates, engaging family members in dialogue when they came to visit, and hopefully one day enjoying the experience of getting to know all of the people who care about him most. The Kenny I had come to know did not do these things, and in fact, many would have assumed that he showed little awareness of his social world. I, however, had this hunch that he was acutely aware of everything that occurred around him, it just did not occur with him in it.

I felt a responsibility, to Kenny and to his parents who were entrusting me with his program, to make an effort to teach Kenny a set of skills for interacting in his world so that he felt successful and, more importantly, safe to do so. A number of years later, I find myself in a position to share with others the story of how one boy with autism and his therapist embarked on a journey, together, to uncover the secrets of how he learned about elements of his social world. Through the telling of our story, I hope to further understanding, while at the same time pull at the heartstrings.

This project describes an intervention, based on applied behavior analysis techniques, designed to improve the social development and theory of mind (ToM) functioning of an 11-year old male student with autism spectrum disorder. In the second chapter, the literature which provided the insight for the intervention is reviewed. This is followed by a chapter describing the materials developed, the procedures used throughout the intervention, and contains a narrative account of a sample day during the three week study. In the fourth and final chapter, a theme-based discussion predicated upon findings obtained through qualitative interviews, questionnaires, and direct observations is presented. An objective of this project is to further knowledge of how behaviourally-based interventions can be used to teach social language and to improve theory of mind functioning, and can be designed to be adaptable to an inclusive school setting.

This initial chapter begins with a brief review of autism spectrum disorder, highlighting the triad of impairments associated with this diagnosis. From there, theory of mind is discussed for its power to provide researchers with a valuable model for understanding the social and communication deficits characteristic of autism. Following an overview of the aims of the present project, the chapter concludes with an ethnographic account introducing readers to Kenny, a boy diagnosed with autism, and provides readers with the context for understanding how the intervention was individualized to both consider Kenny's strengths and to address his needs.

Autism Spectrum Disorder (ASD)

At present, researchers report that, in Canada, the incidence rate of autism spectrum disorder, a pervasive developmental disorder typically identified during childhood, is approximately one in 165 (Fombonne, Zakarian, Bennett, Meng & McLean-

Heywood, 2006). This statistic has seen a marked increase, with the improvement of diagnostic and assessment tools, from the incidence rate of four in 10,000 often cited as recently as 1998. It is estimated that 70,000 individuals in Ontario have autism spectrum disorder (Autism Ontario, 2006). Researchers in the field are sensitive to the knowledge that more and more individuals are now identified as having autism and the result has been an increased impetus for researchers to understand the mysteries of this disorder.

Current diagnostic criteria outline that autism spectrum disorders (ASDs) are characterized by a triad of impairments along language, behavioural, and social continua. Thus children diagnosed with an ASD demonstrate moderate to severe challenges in the areas of communication development, stereotypic behaviour, and social interaction (American Psychiatric Association, 1994). And though not yet formally included within diagnostic criteria, disturbances in sensory modulation are often observed in individuals with autism (Rinehart, Bradshaw, Brereton, & Tonge, 2002).

Frith (2003) provided a detailed description of the triad of impairments, and behavioural examples of each are included here. With respect to impairments of communication, Frith highlighted that many of these children do not speak until quite late (after age three), and some remain completely non-verbal. She added that gestures and facial expressions are not used in the place of speech (Frith). Hence, it is communication as a whole, and not just verbal speech, which is impaired in autism. Frith pointed out that, even when speech develops, communication may not, because many children with autism still are not able to spontaneously generate communicative speech, and may merely echo words or phrases heard.

Regarding the behavioural impairments characterizing autism, Frith (2003) explained that when repetitive motor stereotypes persist in childhood, and do not abate after infancy, this signifies a delay or disturbance in brain development. In the younger child with ASD, observable behaviours may include hand flapping, rocking, or finger movements. In the older child, engagement in repetitive behaviours may manifest as ritualistic routines, preoccupations with specific interests, or repetitive verbal stereotypes and scripts. Frith noted that the earliest diagnostic criteria for autism included that these individuals insist on sameness, in their behaviour and in their environment, and that this is considered one of the cardinal features of autism.

A third cardinal feature of autism, as reviewed by Frith (2003), describes how individuals with this disorder exist in a state of autistic aloneness. Today this is more generally referred to as the impairment of reciprocal social interaction. As Frith explained, evidence for this impairment of the triad is easier to identify in the second and third years of life, when it becomes exceedingly obvious that the child is not engaging in normally expected social responses to others. Other overt behavioural indications of impaired social interaction include poor eye contact, lack of social gestures, lack of interest in social games, dislike of physical contact, and an intense preference for interacting with objects (Frith).

Though this point will be further addressed below, it is my view that it is this impairment of reciprocal social interaction which poses the greatest challenge for those with autism. Frith (2003) cited Leo Kanner's (1943) expression that the fundamental disorder in autism is the children's inability to relate themselves in the ordinary way to people and situations. Indeed, I would agree with this contention, and during my five

years working directly with a child diagnosed with autism, attempting to understand the nature of his social impairment was my primary objective.

Theory of Mind as a Core Deficit in ASD

The term theory of mind was coined by Premack and Woodruff (1978; as cited in Baron-Cohen, Leslie & Frith, 1985), who defined it as the ability to impute mental states to oneself and to others. Moreover, theory of mind (ToM) describes the process of attributing independent mental states to self and to others in order to explain and predict behaviour (Gallagher et al., 2000). Many prominent researchers in the field of autism have focused on the postulate that difficulties in understanding mental states underlie the social and communication deficits observed in diagnosed individuals (Baron-Cohen et al., 1985; Frith 2003). This postulate forms the basis for a model of autism known as the Theory of Mind model.

It is generally accepted that normal development of a theory of mind is fundamentally important for it is this ability that helps us to figure out why people, including ourselves, do what they do. As Sperber explained, attribution of mental states is our natural way of understanding the social environment (cited in Baron-Cohen, 1995). Applied to autism, it is theorized that diagnosed individuals have poorly developed ToM abilities and, thus, are poorly able to infer the mental states of self and others. Further, because they are unable to infer mental states adequately, they are also unable to interpret the behaviours of others. The result is that others are viewed as confusing and unpredictable, and individuals with autism are left unable to communicate and interact in their social environment.

In the literature review chapter to follow, a more thorough summary of the Theory of Mind model of autism and a review of some of the research investigating ToM functioning in those with this disorder, are provided. The ToM model, as applied to autism, is complex and research in the area has not yet shown how best to improve the ToM abilities of those diagnosed with ASD.

Applied Behavior Analysis and ASD

Applied behavior analysis (ABA) is defined as the science in which strategies derived from the principles of behaviour are applied to improve socially significant behaviour and experimentation is used to identify the variables responsible for the improvement of behaviour (Cooper, Heron, & Heward, 2007). Since the publishing of Lovaas' seminal paper in 1987, much research has been conducted on the use of applied behavior analysis for teaching individuals with autism spectrum disorders. According to Reichow and Wolery (2009), recent survey data suggest interventions based on ABA are some of the most frequently used interventions within the field of ASD.

At a number of points within this project, terms associated with ABA are referenced, as teaching strategies consistent with this approach were relied on heavily during Kenny's All About People I Know intervention program. Given that my goal was to improve what I considered socially significant behaviour, the use of ABA techniques was appropriate. Below, seven key ABA terms are defined to facilitate an understanding of Kenny's intervention.

A fundamental principle of ABA is reinforcement. Positive reinforcement occurs when a behaviour is followed immediately by the presentation of a consequence that increases the future frequency of that type of behaviour in similar conditions (Cooper et

al., 2007). Within Kenny's intervention, I delivered rewards and/or praise immediately after he demonstrated improved language and ToM related behaviours to increase the likelihood that he would engage in those behaviours again.

A critical feature of any ABA program is the effective use of prompting and fading. Prompts are actions by an instructor or teacher that accompany an instruction and make the desired behaviour more likely to occur (Neisworth & Wolfe, 2005). Relatedly, errorless teaching goes one step further by having instructors provide enough of a prompt that they know their learner will demonstrate the desired behaviour and ensuring that the prompt is provided right away so that there is no chance the student will make an error (Lynch Barbera, 2007). So that individuals with autism do not become dependent on prompting, fading procedures are employed. Fading is the gradual reduction of prompts over time with the goal that prompts are no longer needed to elicit the desired behaviour (Neisworth & Wolfe).

In behavioural work, the term probe refers to a procedure for assessing the status of a behaviour or extent of language generalization (Neisworth & Wolfe, 2005). During Kenny's intervention, I often needed to conduct probes first to determine whether he had the language skills needed to understand ToM concepts or to be able to ask social questions. Conversely, after I taught Kenny a new language skill, I often needed to provide opportunities for him to generalize the skill. In ABA, the term generalization refers to teaching the student with autism to elicit a particular target skill across different settings and with different people (Neisworth & Wolfe, 2005).

The final term to be defined is mand. The mand is a type of verbal operation in which the individual asks for what he or she needs or wants, and is under the control of

the individual's motivation (Skinner, 1957). Skinner selected the term mand for this type of verbal relation because it is conveniently similar to the words demand and command (Cooper et al., 2007).

Although the above definitions provide cursory information, this list is limited and does not offer a comprehensive explanation of applied behavior analysis techniques. Training in ABA methodology would be required for any individual wishing to implement an intervention analogous to the All About People I Know intervention described in this project.

Purpose of the Project

The overall purpose of this project was to describe a behaviourally-oriented intervention for teaching Theory of Mind concepts in a meaningful, relevant, and concrete manner, specific to one student with autism and his environment. The project describes briefly how the intervention, entitled All About People I Know, improved his social development and ToM functioning. Hence the project reports on conducting an intervention aimed at teaching Kenny the theory of mind concept related to understanding preference. That is, it was hoped that through a personally designed program this student would gain the understanding that others have mental states and preferences all their own, and that, often, an individual's preferences guide their behaviour. Ultimately, I hoped to teach my student with autism that once we get to know others, and their likes and dislikes, we become better able to predict what they may say or do in social situations.

A secondary objective of this project was to provide an *accessible* description of an intervention based on ToM that uses strategies consistent with applied behavior

analysis. However, it was not an objective of this project to attempt to generalize observations of the progress made by one student to others with this disorder.

Another objective of this project was to provide this student with a set of skills, the language and behaviour necessary for learning basic, but fundamental, aspects about others, skills not previously exhibited by this young boy with autism. This set ranged from the initial skills required to approach another person to the complex skills of structuring language in a wide array of question formats.

A final objective of this project was to share the story of how Kenny and I began on a journey to uncover the secrets of how he learns about elements of his social world. Through our work together, the interview accounts of those near him, direct schoolyard observations, and the views of his classroom peers it was my hope to provide an accessible account of Kenny's development and social growth. The data reported in this project were collected for three weeks within a multi-year intervention.

To guide the reporting of the data on Kenny's growth, the following four questions were formulated:

1. To what extent did aspects of the All About People I Know intervention, such as the focus on choosing questions of high interest to the student and the visual nature of the activities, help motivate Kenny to learn about his peers and their preferences?
2. Was Kenny able to learn the language skills necessary for asking his peers, and others, about themselves through the use of positive reinforcement, visual prompts, practice, prompt fading and high levels of repetition?

3. How did Kenny's classroom peers feel about their interactions with Kenny as he made his way through the All About People I Know intervention?
4. How do adults in Kenny's life perceive his social development and have they noticed qualitative differences in his social interaction?

I hope that the findings of this project contribute a rich and descriptive case to the limited population of instructional cases involving teaching children with autism Theory of Mind concepts through the use of applied behavior analysis techniques.

Timeline of the Project

Throughout this paper, three different terms are used to help readers identify separate aspects of what has turned out to be a complex undertaking. The term intervention encompasses a two year frame of time, spanning from July 2004 to June 2006. In essence, the All About People I Know intervention commenced with the targeted teaching of skills Kenny needed to complete six initial activity sheets, described in the ethnographic account to follow.

The term study is ascribed to a three week period which took place in June 2006 as Kenny was finishing Grade 6. During the study, Kenny continued his All About People I Know intervention, with a focus on completing 8 specific intervention activity sheets. In total, Kenny asked approximately 300 social questions within the study period. I was able to observe some of these social interactions directly as, during the three week study, I was permitted to conduct seven half day school observations. At the end of the three week period, interview data was collected from Kenny's educational assistant, teacher, principal, and mother. The study concluded with the collection of questionnaire data from all 28 of Kenny's sixth grade peers.

Lastly, the word project is used to refer to this document which reports on the content of the study.

Who We Are: An Ethnographic Introduction

There is a common thread which wraps itself around this project. This document, and all of the work that came before it, is about relationships: Kenny's relationships with his mother, father, and siblings, my relationship with Kenny's parents, his relationships with his classroom peers and teachers, my relationships with Kenny's educators, and so on. In order for the results of this project to have meaning, significance, or impact, it is important that I first share my accounts of how these relationships evolved. The fabric of my accounts begins with the relationship that grew between Kenny and me.

It was spring of 2002 and I had been working with Kenny as an ABA therapist for a number of months. Through the daily communication notes that came home from school each evening, I was learning about Kenny's strengths, and also about the challenges he was faced with each day at school. Sensing my growing interest, Kenny's mother requested that his school allow me to observe him within the educational setting. At the time, Kenny was placed in an inclusive Grade 1 classroom and received one-on-one educational assistant (EA) support for the majority of the day. My visits to school allowed me to gain a global appreciation for the many complexities associated with the inclusion of students with autism in a regular school setting. More importantly, I gained valuable insights about Kenny. I saw that, though he was physically present in his classroom, he did not appear socially connected to his classmates nor was he a member of the school community. He used language less at school than at home, and many of his behavioural challenges increased in the school environment. However, from the school

visits I also gained tremendously in a third manner. The visits afforded me a look into the world of school-aged children. I caught a glimpse of how children act with one another, eavesdropped on how they talk with one another, and was schooled in the value of being up on kids' culture. Countless times I overheard students talking about themselves, sharing information about the things they liked, or hated, with their friends. From bike riding, to McDonald's, to Shrek, to Bey Blade toys, peers were busy asking, answering, and finding those things which gave them something in common with their peers. In a patchwork kind of way, I drew all of these insights together and brought them into the sessions Kenny and I had together.

When I began working with Kenny, I had recently graduated from university. At first, I had commenced a degree in biology, and part way through my second year realized that what I was actually hungry for was more knowledge about how functions of the brain and body translated into human *behaviour*. So after finishing that degree, I pursued an honours degree in psychology. It did not take long for enjoyment to set in, as I became enthralled with names like Pavlov and Skinner, but also Piaget and Kanner. It fascinates me to know that a mere handful of chapters, a few from each of my abnormal, developmental, and neuropsychology text books, so strongly influenced my thinking and shaped my motivations. Therefore, once I had completed my psychology degree, I began attending workshops and conferences about autism and topics related to the spectrum.

Shortly thereafter, I successfully applied for the therapist position with Kenny and benefited from a great many more opportunities to acquire knowledge on autism, applied behavior analysis, and a related approach known as verbal behavior. Simultaneously, I also began reading about Theory of Mind. Over the next two and a half years, I continued

to study all of these topics, while at the same time gaining invaluable experience. Finally, as Kenny entered Grade 5, I enrolled in a Master's program through the Faculty of Education at Queen's University. It had been that summer, the summer of 2004, when we began the All About People I Know intervention. However, as will be highlighted next, some earlier teaching was necessary before the intervention began.

In behavioural work, the term probe refers to a procedure for assessing the status of a behaviour or extent of language generalization (Neisworth & Wolfe, 2005). I recognized that for Kenny to be able to use language similar to that of his peers, he would need to understand the concepts underlying words such as like, dislike, and favourite. My first step, therefore, was to probe, or assess, Kenny's level of understanding of these concepts.

Through his behavioural programming, Kenny had been taught how to mand (Skinner, 1957), or request, objects and activities that he wanted. For example, as part of our programming Kenny would often colour pictures, yet I would have all of the crayons. The target objective was to help teach Kenny the language needed to request, or mand for, a crayon. He was taught to say "I want the [colour] crayon" and would be reinforced, or rewarded, with the crayon he had requested. Because Kenny was taught how to mand for things like food, games, and activities, I had an observable way of knowing what he wanted in a given situation. However, when I would probe with questions such as "Kenny, which food do you like?" or "What is your favourite colour?" Kenny was unable to respond. Through probing, I learned that my student neither knew the language nor had a conceptual understanding of words associated with his own preferences. If one day Kenny was going to be able to talk with his peers about his preferences and ask them about

theirs, and through this develop an understanding that others have preferences all their own, I would have to teach him the necessary language and concepts. Fortunately, because he had learned how to request, I had a starting point for my teaching.

I can recall, like it was yesterday, the day when I was attempting to confirm that Kenny's favourite colour was red. It is a very quizzical thing to be teaching a person about *their* preferences, and I felt an obligation to Kenny to always be sure of his preferences. So on that day, I laid out a number of t-shirts of various colours and watched as he chose the red one to wear. During our session, when he needed to choose a player piece for Snakes and Ladders, he consistently selected the red one. Various observations lent support to the conclusion that, indeed, Kenny's favourite colour was red. Other preferences were easier to determine, like the fact that his favourite snack was crackers with peanut butter. And clearly his favourite Disney movie was *The Lion King*, despite the fact that he found it so overwhelming for his senses he was no longer able to watch it.

Through the use of concrete examples and over hundreds of trials, I was able to teach Kenny both the language and the underlying concept of favourite. I would place three movies in front of him, ask which was his favourite, and prompt him to reply "My favourite movie is *The Lion King*." Later he would get to look at the cover. Similarly, I would place three snack foods on our worktable, ask which was his favourite, and prompt him to reply "My favourite snack is crackers with peanut butter." Later he would get to eat them. Before long, Kenny was able to generalize this language and could quickly respond when asked a novel question including the word favourite. For example, he soon shared with us that his favourite dinner was tacos. And when one day an *Ice Age* movie

trailer came on, we were able to ask Kenny who his favourite character was, to which he responded Manny the Mammoth.

For me personally, it was a wonderful time. Kenny was beginning to tell us about himself and all of us were enjoying it. I can recall an evening, as I was cleaning up our workroom following a session, when Kenny and his sisters were sitting at the dinner table together. During the session, I had asked both sisters if they would come into our workroom to help out with some programming generalization. The term generalization, in behavioural intervention work, involves teaching the student with autism to elicit a particular target skill across different settings and with different people (Neisworth & Wolfe, 2005). It is recognized that individuals with autism often have difficulty generalizing skills which they learn in a structured teaching environment and, thus, teaching skills across settings and people is a critical component of any behavioural approach (Neisworth & Wolfe).

In the workroom, Kenny had done very well responding to the favourite questions his sisters, Danielle and Brittany, had posed. But it was as they were sitting waiting for dinner to be served that I was able to take in a rewarding sight. That is, both Danielle and Brittany began asking Kenny myriad questions about his favourite things, from his favourite vegetable to his favourite member of The Simpsons television family. But it was the way the scenario evolved, was transformed within just a few minutes, that was most remarkable. It was clear that at first the two girls began the activity as a way to show Dad, who was also in the kitchen, about Kenny's newly learned skill. After a few of Kenny's responses, though, it became obvious that the girls were truly enjoying listening to what he had to say. Numerous times they found his selection hilarious, such as when

he reported that his favourite kind of cake was birthday cake, and moments of laughter would follow. Often, Kenny's responses would trigger a short conversation between the sisters and, equally often, the girls would then share their preferences with Kenny. Through observation, however, it was clear he was not yet at the stage of comprehending such information. Needless to say, I was proud of all three siblings for being such natural teachers. Brittany and Danielle were models of appropriate social interaction and coaches who kept raising the bar so that their brother could keep achieving. Kenny was the teacher of what it means to be truly brave and to overcome life's challenges. And in that evening, the three had taught me something else; that it was time for me to start thinking about the next steps needed for Kenny's learning and social development. It was again time to probe.

A number of days later, I began by drawing a stick figure of Kenny. I then asked him, again, "Kenny, what is your favourite colour?" With his reply, I wrote the word Red in red ink under his picture. I then drew a picture of Mom and probed, "Kenny, what is Mom's favourite colour?" Without hesitation, Kenny replied, "Red." In the same manner, I probed Kenny about his sisters' favourite colours. Both responses were red. It was at this time that I returned to the work conducted by Simon Baron-Cohen (1995) on Theory of Mind in children with autism spectrum disorder.

It had been my hunch that Kenny had difficulties associated with theory of mind functioning. It appeared challenging for him to infer the mental and emotional states of others or to interpret social situations. Through the responses Kenny was giving me, my working hypothesis became that Kenny had not yet developed an understanding that others have their own independent mental states. That is, he was unable to consider that

others might have a different favourite colour because he did not understand that others have their own distinct preferences, thoughts, emotions, beliefs, and so on.

Similarly, Kenny was displaying challenges associated with inferring the emotional states of others. Particularly interesting was that Kenny seemed incredibly hypersensitive to Danielle's emotions, such that her cry would induce visible anxiety and behavioural outbursts from Kenny. He would often make comments such as, "Danielle is crying" or "She feels sad," and frequently this would be accompanied by nervous sounding laughter. Clearly Kenny could name the emotion (sad) and its associated behaviour (crying) based on having learned these labels. Yet if you took Kenny into the room with Danielle and asked him to talk about why she was crying, he was not able to use visual cues in the social environment to infer why she might be sad.

With Kenny, the more visually based learning is, the better able he is to comprehend. So after questioning Kenny about his sisters' favourite colours, and getting the "red" responses, we took a walk together up to their bedrooms. I showed him how his older sister had a purple room, whereas his younger sister had a pink room. We then went to speak with both sisters and I provided Kenny with a visual prompt including the question, "What is your favourite colour?" Their verbal responses confirmed what we had seen visually upstairs; Brittany's favourite colour was purple and Danielle's was pink. I prompted Kenny to include their responses under their stick figures to make the information visual, concrete, and meaningful to him.

Together we then repeated the same process, asking the girls about other concrete and observable preferences. For example, Kenny heard about his sisters' favourite animals, and saw their posters and collections. I began developing a visual record for

Kenny to use to keep track of the preference information he was receiving about each family member. We began with 6 sheets: All About Me (Kenny), All About Danielle, All About Brittany, All About Mom, All About Dad, and All About Michelle (see Appendix A for sample).

In a sense, I was trying to teach Kenny multiple skills at the same time. One, that he could use language to learn things about others. Two, that he could use cues in his social environment to help make other people more predictable and, perhaps, safer to interact with socially. Three, that he could keep a visually-based account of others' responses, one that was structured, repetitive, and could serve as a visual prompt for additional interactions.

For Kenny, however, using language to learn about others would only occur after the difficulty associated with the words themselves was much reduced. My objective was to continue to use ABA techniques such as positive reinforcement, prompting, fading, shaping, and modeling (Cooper et al., 2007) to help Kenny master the verbal language so that the demand associated with interacting would be reduced. In fact, my goal was to make getting to know others a fun game for Kenny and to ensure that he would feel successful. And although we are referring to vocal language in Kenny's case, I anticipate that sign language, the picture exchange communication system (PECS), or an assistive device could be substituted when using this approach with other children with ASDs.

Regarding my aim to teach Kenny that what others say and do can be predicted, and to increase his awareness of what is occurring in his social environment, many of my thoughts came from the writings of Temple Grandin, in addition to Baron-Cohen's ToM model. Temple Grandin, who has autism, shares that "autistic children have to learn

social skills systematically, the same way they learn their school lessons” (Grandin, 1995, p. 134). When speaking of Theory of Mind, Temple Grandin shares her opinion that “it is true that autistics with severe cognitive deficits are unable to look at situations from the vantage point of another person” (p. 136). However, she describes that one of her compensatory strategies for social interactions is to use “visualization and logic to solve problems and work out how people will react” (p. 136). I believed that Kenny had the cognitive ability to learn that others have their own independent preferences and other mental states, and Grandin’s message to teach social skills in a systematic manner resonated with me.

Grandin’s emphasis on how important it is for her to rely on the use of visualization also struck me as significant. Indeed, Kenny is a highly visual learner, as are many children on the autism spectrum. My thought was to construct his visual record so it enabled him to visualize mentally the record of individual people. In a sense, I intended to build a visually-based schema about a person, which Kenny could visualize later when interacting with them or when needing to predict something about them.

Again, the initial six visual All About People I Know activity sheets were all person-specific and included one for Kenny, Danielle, Brittany, Mom, Dad, and Michelle. The fill-in-the-blank activity sheets were three pages long and page one consisted of some fact-type information first, followed by preference-type information. For example, when learning about his sister, Brittany, Kenny began by filling in blanks about her address, telephone number, hair colour, eye colour, age, birthday, siblings’ names, parents’ names, pets’ names, etc. He then moved on to filling in blanks about a few preferences we had already reviewed with Brittany, such as her favourite colour. The

intent was to start Kenny off asking questions that had either observable answers or responses he had already learned. This was because the main focus at this early stage was on using ABA strategies to teach Kenny how to ask the questions he needed to in order to obtain information from five people. Strategies consistent with ABA were briefly defined above, and references have been provided.

By the second page of the activity sheets, Kenny was expected to ask novel preference-type questions, though at this stage I still supplied the content for the question. That is, on page two, Kenny was given phrases such as favourite song, favourite restaurant, favourite computer game, and so on. Finally, by the third page of the activity sheet, Kenny was expected to ask novel questions as well as to come up with the content for the question. All that appeared on the third page were lines including the word favourite, so that the content area was a blank to be filled in, and the response area was also blank. This step-wise approach was used to prevent Kenny from becoming overwhelmed with the level of effort, referred to as response effort within ABA, required to participate in the intervention.

Even before Kenny completed his sheets for the six initial people, a number of things I found interesting occurred. First, and most significant to me, was Kenny appeared to truly enjoy seeing information about *himself* represented in text. I never had any difficulty getting him to want to fill in his All About Me pages. Though at many points he required considerable teaching to understand language concepts involved, such as what a middle name was, Kenny continued to seem self-motivated to work on his personal record. In fact, within the first week of the intervention, I arrived at his home for session one day and found him sitting at our work table reading his All About Me pages.

Second, because the content I had selected for his page two questions revolved around things Kenny was motivated by, he required little prompting or reinforcement for the act of asking questions. At times during the page one stage, Kenny needed fairly high levels of both when it involved posing questions to the five others. By the second pages, however, prompting and reinforcement continued to be necessary for shaping the language associated with the questions, but not for the act itself. This felt positive.

As expected, when Kenny was given total freedom to select his own content for the preference questions he was asking others, nearly all of the early questions involved something to do with movies. Favourite Disney movie, favourite Dreamworks movie, favourite Winnie the Pooh character, and on it went. For a quite a while. However, because I was completely committed to Kenny learning three key things, that others have independent mental states, the language associated with asking wh- questions, and that learning about others is fun, I did not force this issue. Fortunately, what became apparent was that once Kenny had acquired a large amount of a person's movie-related preferences, he himself would switch to asking about other things he was motivated to know, like a person's favourite hotel. This too felt positive.

Last, though certainly not least, the fourth occurrence of significant interest to me came when one day a close friend of the family was visiting and Kenny asked if we could make an All About Peter sheet. Naturally, we did. And that evening, I began thinking about how the intervention could be modified to allow Kenny to learn about his peers at school. The answers to this came, in part, during a school meeting early into Grade 5.

Likely due to the unstructured and chaotic nature of most school yards, many students with ASD struggle during recess times. To add to this, there is then the fact that

poor weather conditions lead to indoor recesses, thus making the concept of recess all the more unpredictable for students with autism. At the school meeting, Kenny's educational team shared that they were having difficulty dealing with negative behaviours associated with recess periods. This information was not entirely new, as Kenny had struggled with recess in previous grades, and his mother explained again that the only real solution was to come up with ways to make recess more structured and routine. Together, Kenny's mother and I offered the suggestion that he could use his recess times, the same times that typically developing students use for social interaction, to complete a structured activity sheet (Talking to Friends sheet) whereby he would ask his peers social questions. In our favour, because Kenny had always required support from an educational assistant during recess, the school team agreed to give the idea a try. Fortunately, they had little to lose and possibly much to gain.

As I hope this project documents, however, many individuals gained from the opportunity for the All About People I Know intervention to be incorporated into Kenny's school life. Therefore, in chapters to follow, I provide a description of how the intervention was structured for Kenny's use at school and, later, offer recommendations to educators who may be interested in incorporating a similar approach for their students with autism.

CHAPTER TWO

REVIEW OF THE LITERATURE

The objective of the following review is to provide a critical summary of literature germane to teaching theory of mind concepts to those diagnosed with autism spectrum disorders. I begin with a historical overview of some of the early research conducted on theory of mind functioning in individuals with autism. From there, I summarize the theory of mind model, as developed most extensively by Simon Baron-Cohen. And, finally, this chapter concludes with a discussion of pertinent literature related to three factors which, it will be argued, affect the teaching of theory of mind.

The Theory of Mind Model

In 1985, researchers Simon Baron-Cohen, Alan Leslie, and Uta Frith conducted one of the first studies examining theory of mind functioning in children with autism. Using Wimmer and Perner's puppet play paradigm (Wimmer & Perner, 1983; as cited in Baron-Cohen et al., 1985), 20 children with autism were compared to 14 children with Down's syndrome and 27 clinically normal preschool children on their ability to employ a theory of mind to infer a 'belief' mental state. In the puppet play paradigm (Wimmer & Perner), participants observe a character, Sally, place a marble into her basket and then leave the scene. The second character, Anne, then transfers the marble and hides it in her box. Then, when Sally returns to the scene, researchers ask the participants the target belief question: "Where will Sally look for her marble?" In order for participants to pass the belief question, they must recognize the doll's false belief and respond with the basket location. Participants fail the belief question if they respond the box location.

Although both control groups responded correctly to the belief question over 80% of the time, only 4 of the 20 children with high functioning autism could correctly respond, indicating 80% failed responding in the autism group (Baron-Cohen et al., 1985). Specifically, the autistic group tended to point to where the marble really was, suggesting that these children were not able to appreciate the difference between their own and the doll's knowledge (Baron-Cohen et al.). These findings supported the researchers' hypothesis that children with autism fail to employ a theory of mind and are unable to represent mental states, resulting in an inability to attribute beliefs to others and, subsequently, to predict the behaviour of others (Baron-Cohen et al.).

In the above mentioned study, a second control group including children with Down's syndrome was necessary in order for the researchers to demonstrate that ToM difficulties experienced by children with autism are independent of mental retardation, and specific to autistic disorder (Baron-Cohen et al., 1985). Similarly, early research established that impaired language development alone can not account for the difficulties children with autism face with ToM functioning. Perner, Frith, Leslie, and Leekham (1989) compared theory of mind ability for 26 children with autism against a control group of 12 children diagnosed with specific language impairment. Across the three tasks used by the researchers, significantly more incorrect responses were given by the group of children with autism (Perner et al.). The authors concluded that, given the high level of performance achieved by the children with specific language impairment, general impairment in language comprehension can be ruled out as solely responsible for ToM task failure in children with autism (Perner et al.). Though their results confirmed the hypothesis that autistic children have profound difficulty with mental state attribution and

communication, the authors highlighted that understanding how and why this difficulty arises remained unanswered questions (Perner et al.).

In an effort to answer the question of whether individuals with autism understand what causes emotion, Baron-Cohen (1991) compared participant responses on tests which separated two emotions (happiness and sadness) across three causes: situations, desires, and beliefs. The test group included 17 children with autism, whose scores were compared against those of two control groups, one composed of 16 children with mental handicap and the second composed of 19 clinically normal children (Baron-Cohen, 1991). Of interest, the researcher also used a minimum verbal mental age of four years as an inclusion criterion for the study, which was selected based on the fact that typically developing children are able to pass the types of tasks used by the time they are four years old (Baron-Cohen).

The results obtained by Baron-Cohen (1991) indicated that the group with autism showed no impairment in their understanding of situations as a cause of emotions within the test used in the study. However, the children with both autism and mental handicap demonstrated more challenge associated with understanding that desires cause emotions (average pass scores of 57% and 59% respectively) compared to the control group of typically developing children (92% pass average), though the difference did not reach significance levels (Baron-Cohen, 1991). This particular result is informative as it suggests that it may not be an autism-specific deficit that affects responding on desire-related tests (Baron-Cohen). In this study, the most highly significant differences were found when the participants were tested on understanding that beliefs can cause emotions. That is, performance by the children with autism was significantly worse than

either of the two control groups, supporting the researcher's prediction that understanding of belief by individuals with autism is severely impaired (Baron-Cohen).

To further investigate the theory of mind deficit in autism, Baron-Cohen (1992) designed a study to examine the relationship between deception and the ability to understand beliefs. Again, two control groups including 15 participants with mental handicap and 15 typically-developing children were used (Baron-Cohen, 1992). The scores of these groups were compared to the scores of the clinical group with autism (n=15) on two separate tasks, specifically a penny-hiding game of deception and a standard false belief task (Baron-Cohen).

Briefly, the penny-hiding deception task involves a hider, who hides a penny in one of their two hands, and a guesser, who then needs to guess which hand contains the penny (Baron-Cohen, 1992). In this study, Baron-Cohen had participants serve first as the guesser and then as the hider, and the strategies they employed as both guesser and hider were scored. For the standard false belief test, participants were shown a common-looking milk carton and asked what they thought was inside, all participants provided the correct response of 'milk' (Baron-Cohen). Participants were shown that, in fact, the milk carton contained a ball, and were then asked the false-belief test question about what they had thought was inside the box before having been shown (Baron-Cohen).

The results of the false belief test mirrored those of earlier studies, the group with autism performed significantly worse than either of the two control groups, where only four of the participants with autism were able to respond that they had thought that milk was inside the carton (Baron-Cohen, 1992).

When analyzing the results of the penny-hiding game, Baron-Cohen (1992) made a distinction between object occlusion strategies versus information occlusion strategies. Object occlusion referred to any strategy used by the participant to keep the penny out of sight, whereas information occlusion referred to any strategy used to occlude information as to the penny's whereabouts (Baron-Cohen). An example of information occlusion might include keeping their hands out of sight while moving the penny into one of their hands. He found there were no significant differences in terms of the number of participants in each group who succeeded in object occlusion, but found significantly fewer participants with autism who showed information occlusion strategies (Baron-Cohen). Although four participants with autism passed the false belief test, only two passed the penny-hiding game in showing information occlusions (Baron-Cohen). Therefore, as the participants with autism failed to show deception, measured in this study by information occlusion strategies, the results suggest that those with autism were oblivious to the guesser's belief state (Baron-Cohen).

In his discussion, Baron-Cohen (1992) offered a cognitive explanation for the deception impairment observed in the participants with autism. He suggested that the deception impairment is an example of how the theory of mind deficit in autism affects behaviour in the real world (Baron-Cohen). He surmised that individuals with autism can understand seeing, and therefore object occlusion, but are not able to understand that seeing leads to knowing, and having a belief. A final important note regarding this study is that, whereas the mean age of the typically-developing group of children was 3.8 years, the mean age for the autism and mental handicap groups was approximately 15 years (Baron-Cohen). Given the results obtained, Baron-Cohen did, in fact, replicate earlier

work showing that teenagers with autism perform much like 2- to 3- year olds on deception tasks.

Based on his extensive findings, Simon Baron-Cohen published a comprehensive description of his ToM model in 1995. *Mindblindness: An Essay on Autism and Theory of Mind* (1995) documents the empirical research upon which Baron-Cohen founds his thesis that individuals diagnosed with autism suffer from mindblindness. In his definition, when one is mindblind, one is blind to the existence of mental states such as thoughts, beliefs, knowledge, desires, and intentions (Baron-Cohen). He contends that there are certain fundamental psychological mechanisms that underlie the ability to mindread, and that the development of one or more of these mechanisms is both delayed and deviant in those who are mindblind (Baron-Cohen).

Briefly, in the mindreading system proposed by Baron-Cohen (1995), four mechanisms including (a) Intentionality Detector, (b) Eye-Direction Detector, (c) Shared-Attention Mechanism, and (d) Theory of Mind Mechanism work together in developing mindreading ability. For the purposes of the present review only two of these mechanisms, the Shared-Attention Mechanism (SAM) and the Theory-of-Mind Mechanism (ToMM) are considered, because Baron-Cohen postulates that it is likely one or both of these mechanisms which is impaired in autism. First, the main function of SAM, as its name suggests, is to form mental representations encoding when two or more individuals are attending to the same object (Baron-Cohen). Further, SAM receives incoming information about the possible intentions another has regarding the object, such as 'seeing' or 'wanting', and encodes this relationship into the mental representation (Baron-Cohen). The information from SAM is then used by the ToM Mechanism, which

is a system for inferring mental states from behaviour (Baron-Cohen). The goal of ToMM is to convert the representation, now including mental states, into a useful theory (Baron-Cohen) which the individual employs to both explain behaviour and, if beneficial, predict future behaviour.

As was mentioned, a question remains as to whether the mindblindness suffered by those with autism results from damage either to SAM or to ToMM (Baron-Cohen, 1995). However, what the model offers is an explanation for the impaired theory of mind functioning of those with autism, for their apparent blindness to the mental states of others and, hence, for the various social and communication challenges faced by individuals with ASD. As the following sections highlight, some of the questions in greater need of answering are those pertaining to how best to teach theory of mind concepts to those with autism in an effort to help improve their overall ToM functioning.

Factors Affecting the Teaching of ToM Skills to Those with ASD

As the overall aim for this project is concerned with the extent to which a child-specific intervention is able to improve his ToM development and functioning, it is necessary to review the literature pertaining to those factors which may affect the teaching of ToM concepts to individuals with autism spectrum disorder. Specifically, three key factors are addressed. First, it appears that highly variable levels in theory of mind functioning exist across individuals on the autism spectrum and evidence highlighting this variability is presented. How this factor impacts both the teaching of ToM skills and our ability to generalize across ToM interventions will then be discussed. Second, research is reviewed about how intervention duration affects the teaching of

ToM skills. Finally, the third factor assumed to play a key role in the teaching of ToM skills to those with ASD is language ability.

Factors Affecting ToM Teaching: Variability in ToM Functioning

Empirical evidence supports the argument that different individuals within the autism spectrum display differing levels of theory of mind functioning. For example, in a study by Sicotte and Stemberger (1999) children ranging in age from 9 to 14 years, who were diagnosed with Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), a general disorder on the autism spectrum, were found to be deficient in ToM ability. Specifically, only 36% of the 14 participants with PDD-NOS were able to predict accurately what another child might believe is inside a candy box (Sicotte & Stemberger). However, this finding differs significantly from the findings reported in an earlier study employing an identical ToM task with children diagnosed with autism. That is, Perner, et al. (1989) reported that only 20% of the children with autism in their sample were able to demonstrate ToM ability sufficient to allow them to predict a correct response. PDD-NOS is often considered a less severe condition than autism on the autism spectrum of disorders, and hence, the results reported in both studies suggest that individuals falling along different areas of the spectrum may have greater or less ToM ability than other ASD diagnosed individuals.

Another condition thought to fall within the autism spectrum is Asperger syndrome. A study conducted by Jolliffe and Baron-Cohen (1999) compared the theory of mind functioning of adults with autism to adults with Asperger syndrome, where both groups were of similar age, using an advanced ToM task which assesses the ability to interpret a non-literal statement. For example, a sample task may depict one character

making a sarcastic (non-literal) comment to a second character and participants are asked to provide an appropriate justification for the non-literal remark. Jolliffe and Baron-Cohen found that the autism group had greater difficulty with the theory of mind task. That is, all 17 of the individuals with autism gave at least one inappropriate mental state (ToM) response, whereas only 12 out of 17 participants with Asperger's Syndrome responded inappropriately at least once (Jolliffe & Baron-Cohen). In contrast, both the autism and Asperger groups performed equally well on a control test not requiring the use of ToM reasoning (Jolliffe & Baron-Cohen). The results of this study support the claim that individuals diagnosed with ASD may exhibit differing levels of theory of mind functioning.

Whereas the studies described above represent three out of many aimed at examining how individuals across the autism spectrum differ in their theory of mind functioning, a more current trend is for researchers to investigate how children across the autism spectrum respond to ToM-based social training paradigms. For example, Gevers, Clifford, Mager, and Boer (2006) studied the effectiveness of a ToM-based social-cognition training program specifically with children diagnosed with PDD-NOS. Theirs was a study including 18 children, ages eight to eleven years, with no control condition (Gevers, et al.). The training was provided to groups of five or six children, in 21 weekly one-hour sessions, and targeted the development of ToM (Gevers, et al.).

Compared to their pre-treatment scores on a measure of theory of mind functioning, the children with PDD-NOS showed significant progress in ToM areas including perception, imitation, first-order belief, pretense, and understanding of humour (Gevers, et al., 2006). Therefore, despite design limitations, Gevers et al. concluded that

their preliminary results support the idea that school-aged children diagnosed with PDD-NOS are able to profit from a ToM-based training program.

Many interpretations and implications of the findings reported in the studies summarized above may be posed. However, two important implications are worth noting with respect to the present project. The first implication of these findings is that it is fundamental to tailor a theory of mind intervention to the specific strengths and needs of an individual with ASD. For example, I was aware through previous teaching that Kenny had achieved an important first step in ToM functioning. That is, he had learned how to recognize a number of emotions including happy, sad, angry, scared, excited, and, to some extent, surprised. I knew that through my own teaching, Kenny had come to understand the notion that, within a category, he had 'favourites' (such as his favourite side dish is French fries). However, I was also aware that if you asked Kenny what he thought was another person's favourite colour, the response given would invariably be red. Red is Kenny's favourite colour. And finally, I was all too aware that Kenny did not have the skills necessary to approach another individual for the purpose of asking them about their favourite colour. As the reviewed literature supports, much variability exists in the ToM functioning of individuals with ASD, and this needs to be considered when implementing a theory of mind intervention.

The second implication of the findings is that one must exercise caution when generalizing the effectiveness of a ToM skill teaching paradigm to other individuals with this disorder. Hence, as was stated in the Purpose section, it is not assumed that the results described in the present project will necessarily generalize to others with autism. It is hoped, however, that analogous results may appear should the intervention be

employed with a child of similar age and with a similar level of ToM functioning at the onset of intervention.

As a final point on the issue of the level of variability in ToM functioning that can be exhibited by individuals diagnosed with an autism spectrum disorder, other studies suggest that ToM functioning in adults with high-functioning autism and with Asperger syndrome may not be as widely variable as was reported earlier. For example, in their study, Rutherford, Baron-Cohen, and Wheelwright (2002) did not discriminate between these two groups when examining ToM deficits in extracting mental state information from vocalizations. I expect that future studies will continue to examine ToM functioning differences in the ASD population and to report how such differences impact ToM skill teaching.

Factors Affecting ToM Teaching: Duration of Intervention

A pertinent question to arise during the development of any intervention requires the researcher to determine for how long the intervention will continue, that is, its duration. Often, the duration of an intervention is predicated upon resource availability, such as time, money, and personnel. However, when one considers that the normal development of theory of mind in neurotypical children spans the first three to four years of life (Baron-Cohen, 1995), it seems probable that the variable of duration will significantly impact the effectiveness of an intervention aimed at developing ToM functioning in those with autism. A review of the following studies highlights this argument.

Around the same time Simon Baron-Cohen published his comprehensive ToM model, researchers Ozonoff and Miller (1995) conducted one of the first studies aimed at

incorporating theory of mind teaching into a social skills training program. In addition to targeting interactional and conversational skills, their program provided explicit instruction in the underlying social-cognitive principles needed to infer the mental states of others (Ozonoff & Miller). As an important note about this study, although a matched control group design was used, the treatment group consisted of five adolescent boys with autism with normal IQ and, due to the limited availability of some participants, it was not possible for group assignment to be random (Ozonoff & Miller). Intervention duration totaled 21 hours, and was broken down into fourteen sessions each lasting 90 minutes. The first seven sessions focused on teaching basic interactional and conversational skills, and these were followed by seven sessions targeting perspective-taking and theory of mind skills using a role-play program format.

In their study, Ozonoff and Miller (1995) utilized four different theory of mind tasks at pre- and post-test, including a standard false belief task (similar to the milk carton task described above), two second-order belief tasks, and a more advanced third-order ToM task (see Ozonoff & Miller, 1995 for detailed descriptions of the tasks). Based on calculations of effect size, the magnitude of the difference between the treatment and control groups at posttreatment testing was 0.64, which is considered a medium to large effect (Ozonoff & Miller). Therefore, the results supported the authors' conclusion that a social skills training program providing direct instruction in ToM principles was able to substantially improve performance on several false belief tasks.

In offering a critical reflection of their findings, however, Ozonoff and Miller (1995) highlighted that it was more likely that their participants had been taught how to solve false-belief tasks, as opposed to having acquired theory of mind abilities. They

shared their impression that their participants' abilities to translate the theory of mind principles to everyday conversations and interactions remained limited at post-test (Ozonoff & Miller). Nevertheless, this study was the first to demonstrate that, with sufficient teaching duration, some aspects of ToM functioning can be taught and that this characteristic impairment in individuals with autism can be helped by intervention. Additionally, the authors stressed the need for future research to examine how long treatments must last for maximal benefit to individuals with autism.

Shortly after, Hadwin, Baron-Cohen, Howlin and Hill (1997) examined whether teaching children with autism to pass theory of mind tasks through short-term intensive teaching results in communication improvements, mental state term usage, and mental state understanding. Their intervention design incorporated ToM teaching sessions of half-hour length for eight consecutive days (Hadwin et al.). Thirty children with autism, all nine years of age and with similar verbal mental ages, were divided into one of three ToM intervention groups targeting the teaching of emotion, belief, or pretend play (Hadwin et al.). The results obtained by these researchers showed no discernible improvement on communication or mental state understanding measures following the theory of mind teaching intervention (Hadwin et al.). The authors concluded that children taught to pass theory of mind tasks through such short-term teaching paradigms do not understand the conceptual ideas underlying ToM tasks (Hadwin et al.).

Final remarks of the Hadwin et al. (1997) study suggested that future research needed to address the question of whether significant improvements in mental state understanding could be achieved if duration of intervention was increased. The following year, Steiner Bell (1998) employed an intervention design consisting of 12 one-hour

teaching sessions that followed six one-hour rapport building sessions. Where Hadwin et al. had allocated a total of four hours to ToM teaching, Steiner Bell had allocated a total of 12 hours for this purpose.

In her multiple case study, Steiner Bell (1998) investigated teaching mental state understanding using visual supports in the form of an instructional videotape. The video was associated with first order beliefs, and featured actors and scenes for teaching ToM concepts related to emotion and belief (Steiner Bell). Computer-generated supplementary materials offered additional visual support for the students, and provided a means for the male participants to make responses to questions (Steiner Bell). In general, the results of the outcome assessment measures showed that the three children studied did make individual progress in the ToM categories of emotion and belief understanding (Steiner Bell).

More recently, a single case study examined whether the social competence of a sixth grade student with high-functioning autism would improve following participation in a theory of mind and social skills training program (Feng, Lo, Tsai, & Cartledge, 2008). Based on the rate at which the student displayed learning of target skill areas, 35 training sessions (40 minutes each) were necessary, for a total intervention duration of 23 hours (Feng, et al.). Four theory of mind skill areas and four social interaction skill areas were targeted across two stages of the intervention. ToM related skills included identifying desire-based emotion and basic belief, and moved on to more advanced understanding of first- and second-order false beliefs. The social skill areas targeted included expressing one's own emotions, controlling anger, expressing greetings, and expressing one's need appropriately.

As their pre- and post-test measure of ToM ability, the researchers elected to use the Test of Theory of Mind (TToM) developed by the first author of this study (Feng, 2001 as cited in Feng, et al., 2008). At pre-test the participant scored 56% on the measure, whereas he obtained a score of 92% at post-test, for an improvement of 36% accuracy on the TToM (Feng, et al.). The results of this investigation showed that, after receiving 23 hours of theory of mind and social skills training, the student's ToM skills had greatly improved. Equally relevant to the current discussion, these researchers also noted that their data showed that more sessions were needed when teaching ToM skills, such as identify emotions and basic beliefs, than when teaching social skills (Feng, et al.).

Taken together, the findings offered by the studies reviewed in this section support the argument that interventions of longer, rather than shorter, duration are more effective at promoting ToM ability. As the present project reports on a longer term intervention of lengthy duration, it is hoped that the study data obtained will add further insight as to what constitutes appropriate intervention duration when teaching individuals diagnosed with autism spectrum disorders concepts related to theory of mind.

Factors Affecting ToM Teaching: The Relationship Between Language and ToM

In a number of studies in the ToM literature, the relationship between language and theory of mind has been investigated. Earlier findings, such as those reported by Happé (1995), indicate that children with autism who pass basic ToM tasks have a much higher language level than those who fail, and require a higher level of language than normally developing children to pass. More specifically, in Happé's study it was found that in a sample of 70 normal children, those with a verbal mental age of four years had a 50% probability of passing ToM tasks akin to the one described above where participants

are asked to predict what another child will think is inside a candy box (Happé).

However, from a sample of 70 children diagnosed with autism, a verbal mental age of nine years was required for these children to achieve the same probability of passing the ToM tasks (Happé).

Undeniably, the nature of the relationship between language and theory of mind functioning in individuals with autism spectrum disorder has significant implications for the development of interventions to teach ToM in this population. As noted by Fisher, Happé, and Dunn (2005) a causal relationship between language and theory of mind may go in either direction. That is, a certain level of language ability may be a necessary precursor for the acquisition of a theory of mind, or it may be that possessing a theory of mind facilitates the development of language (Fisher et al.). However, it may also be that no direct causal relationship exists, but that language could indirectly provide children with autism with compensatory strategies for understanding theory of mind concepts (Fisher et al.).

In an effort to further investigate whether a causal relationship may exist between language and theory of mind, Fisher et al. (2005) conducted a correlational study including 58 children with ASD and 118 children with moderate learning difficulties (MLD). Both groups of participants were scored on measures of vocabulary and grammar ability, and were then administered two ToM tasks in which they needed to correctly predict another child's belief and provide an appropriate justification for that belief. Vocabulary and grammar correlations with ToM task performance support a relationship between language and theory of mind (Fisher et al.). However, a stronger correlation between grammar and ToM does suggest causality direction for, as the researchers

hypothesized, it is unlikely that a theory of mind is required for the acquisition of grammar in those with autism (Fisher et al.).

The results reported by Fisher et al. (2005) confirmed that, in their sample, language predicted ToM task performance correctly in 90% of the ASD group, but only in 65% of the MLD group. Furthermore, for the group with autism spectrum disorder, grammar was found to be a superior predictor of ToM task performance, prompting these researchers to argue that some grammatical understanding is a precursor to theory of mind (Fisher et al.). They speculated that individuals with ASD may possibly be using alternative, linguistically based, routes to mental state representational thought (Fisher et al.). Finally, the authors also acknowledged the limitations inherent in correlational research and pointed out that further longitudinal studies are necessary for a closer examination of the causal relationship between language and ToM.

Beneficially, research investigating the relationship between language and theory of mind continues to gain momentum, and more recent studies conducted by Baron-Cohen and his colleagues add to our understanding. First, a study reported in 2007 compared a group of 12 children with autism who had low levels of language to a group of 15 children with Specific Language Impairment (SLI), and to a control group of 15 typically developing children (Colle, Baron-Cohen, & Hill, 2007). The researchers selected these experimental groups based on reports that false belief understanding is intact in children with SLI, which suggests that false belief, and, therefore, theory of mind, is to some extent independent of language ability (Colle, et al.).

Through the use of a non-verbal false belief test, these researchers obtained results confirming that a ToM impairment was still evident in the low functioning

children with autism (Colle, et al., 2007). However, both the control group and the group consisting of children with Specific Language Impairment did not show any difficulty on the non-verbal false belief test (Colle, et al.). Based on these findings, the researchers concluded that, although language and ToM generally emerge in parallel, supporting each other in their reciprocal development, language and ToM development must be relatively independent and can also be selectively impaired (Colle, et al.).

In another study, Golan, Baron-Cohen, and Golan (2008) studied how children with and without autism spectrum conditions performed on a task assessing recognition of complex emotions and mental states in social contexts. The general results of the study showed that the group of 23 high-functioning children with autism scored significantly lower on the Reading the Mind in Films Task- Child Version (RMF-C) than a group of 24 matched controls (Golan, et al., 2008). The RMF-C task uses 22 short scenes, depicting socio-emotional interactions between characters, taken from four children's films (Golan, et al.). Participants watch the clip and are asked to select one emotion or mental state word, from a choice of four, which best describes how the target character is feeling.

It must be noted that, although the researchers' main objective was to study complex emotion and mental state recognition, their detailed findings also supported previous reports that children and adults with high-functioning autism use verbal content as a way to compensate for their difficulties in processing non-verbal socio-emotional cues in social situations (Golan, et al.). As an example, 22% of the group with autism incorrectly labelled the emotional state of a character in a specific film clip as *sorry*, compared to only 8% of controls (Golan, et al.). Interestingly, in this clip a separate

character makes the statement “I’m sorry, I know you’re closed”, suggesting that the participants with autism who responded incorrectly were relying on verbal cues to ascertain character’s mental states (Golan, et al.). The authors conclude by highlighting the need for further investigation to examine the strategies children with autism spectrum conditions use to interpret emotional and mental states.

As research has yet to provide conclusive answers regarding the relationship between language and theory of mind functioning, the intervention designed for the present project targeted the development of both abilities. A significant amount of effort was necessary to teach Kenny the language required to get to know about his peers, their preferences, and their dislikes. An equal amount of effort went into presenting Kenny with a complete picture of how the thoughts, words, and actions of others can be guided by their preferences so that he could acquire this ToM understanding at a conceptual, rather than a superficial, level.

In reviewing the literature pertaining to theory of mind in autism spectrum disorder, it is evident that there is a need for more research in this area. Future studies of two kinds are essential. That is, though we need to understand more about the nature of ToM specific deficits in individuals with autism, we are also in need of more instruction-focused studies to help parents, educators, and other professionals develop appropriate programming for these complex exceptional learners.

CHAPTER THREE

METHOD

This chapter outlines the method used to complete a three week focal study as part of the present project. The first three sections describe the focal, peer and interview participants. The materials developed for Kenny's All About People I Know intervention are described and an explanation of the project design is provided. This is supplemented by an account of a sample day during the study and includes my first hand observations. The chapter concludes with a brief description of the method used to guide the analysis of the data. As human participants were involved, approval to conduct this study was obtained from the General Research Ethics Board (GREB) at Queen's University (see Appendix B for ethical clearance letter).

Focal Participant

For the present project, a single case design was employed. The focal participant was Kenny, my student, an eleven year old boy who was formally diagnosed with autism at age three years four months. Using developmentally-appropriate language, I verbally explained to him the purpose of the three week study and asked him questions concerning whether he wanted to do this with me and if it would be okay if I wrote it all down. I told Kenny that we could stop the study at any time. Legal consent (see Appendix C for parent consent form) was obtained from both his mother and father. A Letter of Information (see Appendix D) clearly outlining the purpose of the project, the three week duration of the study, the assignment of pseudonyms, and the degree of involvement required of them was issued.

Peer Participants

The focal participant had 28 classroom peers with whom he had been interacting as part of the All About People I Know intervention work Kenny and I had done together prior to this three week study. Through my teaching, the focal participant was asking peers at school questions about themselves. I provided Letters of Information to the parents of all 28 students, asking for permission to have their children participate specifically in the three week study. Parents were provided with a sample of the type of information their son or daughter might be sharing with Kenny (e.g. favourite colour, sport, subject, etc.) so they were clearly informed prior to giving consent.

As part of the study phase I conducted, the focal participant continued to interact with his peers each day for three weeks within June 2006, asking them social questions during the three recess periods included as part of the school day structure (see Intervention Design). During the study, Kenny continued his All About People I Know intervention, with a focus on completing 8 specific intervention activity sheets. These included five topic specific activity sheets and three person specific sheets. In total, Kenny asked approximately 300 social questions within the study period. I visited the school on seven different days to conduct half day observations of Kenny's social interactions. All students were assigned a pseudonym and only these appeared in my observational notes. In the Letter of Information provided, families were informed of their right to withdraw their son or daughter from the study at any time.

Parents of the 28 peers were also asked to consent to having their son or daughter complete a 15-minute anonymous peer questionnaire (see Appendix E for peer questionnaire) which was distributed in their classroom. On the brief questionnaire, peers

were asked to respond to three questions concerning their social interactions with the focal participant. At the time of dissemination, students were told that the questionnaire would take 15 minutes to complete and were informed of their right to withdraw at any time. No students chose to withdraw from completing the questionnaire. As the study involved the collection of data from students in an elementary school setting, School Board Approval was obtained prior to commencement.

Interview Participants

Four adults were interviewed for the study. First, the mother of the focal participant was asked to participate in a 45-minute interview at a place and time of her choosing (see Appendix F for interview guide). In the Letter of Information issued, she was informed that the purpose of the interview would be to have her share her views on the social development of her son with autism and on the intervention developed to enhance his social functioning. A signed Consent Form was obtained.

Three school staff members, the focal participant's classroom teacher, Mrs. Daniels, educational assistant, Mrs. Lowry, and school principal, Ms. Richards, were asked to participate in 30-minute interviews following completion of the intervention (see Appendix G for interview guide). Letters of Information provided to them outlined the objectives for the interview and signed consents were obtained. Please note, the pseudonym Mrs. Johnson appears later in this paper, and refers to a teacher who was not interviewed, but who had daily interactions with Kenny during the study.

All four interviews were audiotaped for the purpose of verbatim transcription, and again, only pseudonyms appeared in the transcribed data. As this study involved the collection of data from school staff members, School Board Approval was required for

this component of the study. At no point in the data was the identity of the school, school board, or city disclosed.

In summary, the forms of data collected during the three-week focal period of this project included direct observations, anonymous peer questionnaires, interviews with the participant's mother, and interviews with three school educators.

Materials

I designed an intervention program entitled All About People I Know for Kenny prior to this project, which consisted of a number of fill-in-the-blank type activity sheets the focal participant completed with personal information about his peers at school. Appendix H includes samples of the intervention documents. Through this highly structured and visually-based intervention program, and aided by the use of visual prompts, repetition, and positive reinforcement, I hoped to continue to teach Kenny how to initiate social interactions with the goal of obtaining personal information about another. That is, the focal participant was taught how to ask his peers who, what, where, when, why, which, and how questions to gain information about, for example, their family, their favourite food, etc. More than this, however, I hoped to see my student with autism come to understand three important ideas; that others have mental states all their own, that we can use language to gain information about another's mental state, and that getting to know others can be an enjoyable and rewarding experience.

The materials used, therefore, included a two-page All About My Friend X activity sheet (see Appendix H) completed by the focal participant. As described previously, the structure of the All About My Friend X peer sheet was designed intentionally and purposefully. During the initial stage of becoming acquainted with his

peer, questions asked were prompted by information the focal participant saw as missing on the first page of the peer activity sheet. However, by the second page of the activity sheet for that peer, Kenny was to be choosing his own preference topics to guide his questions. I selected this approach for I had learned that, for this student, it was too cognitively challenging to have him learn complex language simultaneously with demanding independent and creative thought. It had proven less frustrating for him if the language component of a skill was learned and reinforced first. Yet it was also my reasoning that this intervention needed to be meaningful and relevant for my student, and he deserved some creative control over what he wanted to learn about his peers. Hence, by completing the All About My Friend X activities, Kenny was to learn some pre-determined, as well as self-selected, facts about his classroom peers.

In addition to the peer-specific worksheets described, various topic-specific activity sheets were completed by my student (see samples included in Appendix H). The topic-specific activity sheets evolved when I observed that Kenny was beginning to draw similarities and comparisons between his peers. For example, a question which first appeared on All About My Friend X pertained to stating a favourite junk food. As would be expected, numerous peers responded with “Chips.” During one particular evening session, I probed with the question, “Kenny, can you tell me a few friends who ALL like chips the most?” Kenny was able to do so easily, and followed this with his own independent statement naming a number of people who “ALL had the favourite restaurant McDonalds.” This event led me to develop the topic-specific activity sheets so that we would have an additional means to visually represent information about Kenny’s

peers, a means focused more specifically on depicting for him how others may, or may not, have things in common.

I would like to share two additional points of interest here. The first pertains to how the topic-specific activity sheets also allowed Kenny to learn the more subtle idea that, within the same concept, others can be both similar and different. Take, for example, the idea that a number of his peers shared a common preference for chips. By introducing Kenny to an activity sheet where the question was “what is your favourite kind of chips?”, he was able to learn that those peers differed in their preference for a specific flavour. Wonderfully, as will be shared in the theme-based discussion, this particular learning experience yielded direct benefits to Kenny.

The second point of interest I would like to share speaks, in part, to the benefit of keeping teaching materials simple. At different times within the All About People I Know intervention, it proved helpful that our simple activities were easy to modify to meet the needs of the student. For example, at a point within Kenny’s ABA program, he was being taught time concepts related to past-present-future. At the same time, he was learning about different jobs (careers) at school. When he began to demonstrate understanding of both time and careers as concepts, I introduced an activity sheet whereby he was asking his peers, “What do you want to be when you grow up?” This pulled together both teaching objectives into a question I hoped would make all of the learning he was doing relevant to him. It felt like a good fit and it felt right teaching Kenny the language associated with a question we hear kids sometimes ask each other naturally. On the activity sheet, the only modification that was necessary was adding the

words ‘in the future’ as this was the language familiar to Kenny (this activity sheet is included in the samples provided in Appendix H).

In total, three types of activity sheets were associated with the All About People I Know intervention program during this project. These included the peer-specific forms, the topic-specific forms, and a worksheet completed by Kenny each evening, as he prepared the social questions he was going to ask at school the next day. This third sheet, entitled Talking To Friends, which over time became nicknamed Kenny’s T.T.F, served both as teaching tool and visual prompt, to be further described below.

Study Design

A study period of three weeks was allowed for completing a selected number of All About People I Know intervention activities, including 3 peer-specific and 5 topic-specific sheets. Teaching time required for the intervention totaled approximately 30 hours, based on two hours per day, five days a week, for three weeks. During the two-hour ABA home-based teaching sessions, a number of component teaching tasks took place. These are described within the sample day account below. The study design also included seven half-day field observations conducted at Kenny’s school, on the yard as well as in the classroom. A sample description of how the school-based observations took place is also provided in the account below.

A Sample Day

As I sit here now and try to write this section, I am challenged by how best to provide readers with a snapshot of how a day during the three week study would unfold. In truth, when my supervisor presented me with the idea of including a sample day in the Method section, my first reaction was that the information I would be providing was

data, and should therefore only be offered in the fourth chapter. But of course, her insight allowed me to reflect on the fact that I can neither describe the intervention design nor discuss the findings with any real quality until I offer readers a glimpse through my eyes. So here it is.

It is three thirty in the afternoon on one of the study's non-school observation days. I was scheduled to conduct observations the following day at school, which is where this account will end. I am at Kenny's home waiting for him to get dropped off by the bus, preparing for our evening session. Right now it is quiet in the cool room in the basement where we work together, and I take a couple of moments to flip through the numerous pages Kenny has already completed in the All About People I Know binder. Next to the binder on the wooden table is a bowl of regular chips, one of Kenny's favourite after school snacks, one of my favourite things to use as edible positive reinforcement along with praise from me. Early on in the intervention, Kenny would receive a chip every time he practiced asking one of his social questions or correctly recalled one of his peer's responses. Now that both the language and the task are somewhat easier for him, he receives a chip less frequently, on an intermittent schedule of reinforcement (Cooper, et al., 2007). During a session, however, Kenny will get a handful of five or six chips when he makes spontaneous comments about his friends or asks spontaneous social questions. I want to differentially reinforce (Cooper, et al., 2007) *spontaneous* social language, especially any uses of language that show me that he is applying theory of mind skills, like acknowledging that someone else has their own independent preferences.

Outside, the neighbour's dog starts to bark, a reliable signal that the bus has arrived. I quickly finish sharpening the pencils and head upstairs. As Kenny walks in through the kitchen door he says, "Hi Michelle" without looking directly at me. I return his greeting and ask him if regular chips are okay for snack today. This time Kenny makes great eye contact as he emphatically replies, "Yes." While he performs his routine of emptying his lunchbox and getting himself a drink to bring into session, I verbally share with him a list of the activities we will be doing together during our session. Structure and a sense of predictability have always been important factors for successful sessions, and when we arrive downstairs Kenny quickly scans our visual word-based schedule to confirm the information. There are also a number of spots in our schedule for Kenny to choose what he would like to do, and today his two selections are to play Pac Man with his younger sister (we were also working on sharing and turn-taking) and to make a new All About My Friend activity sheet. When I asked him who this new sheet would be about, he let me know that he wanted to make a sheet about one of his neighbours.

Though this was not the first time Kenny had spontaneously requested making one of the activity sheets for a novel individual, I offered Kenny much praise so as to positively reinforce his motivation to learn about others in his social world. Obviously, I was very happy to see him generalize beyond family members and school peers, to use the activity with neighbours. I was also curious to see what kind of information Kenny would choose to learn about his neighbour.

After completing a task aimed at increasing Kenny's ability to recall events from his day at school, it was time to move on to the next set of items on our schedule, those

associated with the All About People I Know intervention. As stated, this program required approximately two hours of teaching time during our evening sessions for the three week duration of the study. Like most days, today Kenny started by recording the answers he had received from his peers at school into his All About People I Know binder. He got out the Talking To Friends (TTF) sheet he had made last evening during session, which now included his peers' responses, and handed it to me. While at school today Kenny would have used the sheet as a visual prompt to guide him through his social interactions, at home he is now able to recall the information provided by his peers easily without using the sheet at all. This is considerable progress, as early in the intervention Kenny had much difficulty recalling responses given to him by his peers during recess, and needed to rely heavily on the TTF sheet while transferring the information to his binder.

As Kenny is handing me the TTF sheet, he tells me, "First, I want to do the Wendy's sheet." This is one of the topic-specific sheets presently being used for the study, where Kenny is finding out which items from Wendy's restaurant his peers prefer. I reply with, "Okay, sure" and without additional prompting Kenny proceeds to verbally share with me that "Steven likes to order fries, Sarah likes to order a Frosty, and Michael likes to order a cheeseburger." As he spoke, Kenny was printing the information in his binder. Next, Kenny moved on to another topic sheet about favourite kinds of chips, and in this case was able to fill in the last three peer responses he needed to complete the sheet. Kenny was clearly pleased to have completed another sheet, saying "Michelle, learning about my friends' favourite chips is all done." I praised the good work he had done and asked him to "tell me about their favourite chips." Easily, Kenny began

drawing similarities, telling me about which friends all liked Doritos and which all liked ketchup chips.

From here, Kenny moved on to record a few responses he had received from his peers, Jessica and Steven, for whom Kenny was now completing peer-specific activity sheets. Kenny was on the second page for each of these peers and last evening had selected to ask them about their favourite holiday and board game, as well as which food they disliked the most. After recording their responses, I asked Kenny what else he would like to learn about Jessica and Steven. He chose to ask them about their favourite school subject and about what they were going to do in the summer (it is late June and the end of the school year is approaching). These questions for Jessica and Steven would later be added to Kenny's TTF sheet, for him to use the next day at school.

The final set of peer responses Kenny was adding to his binder were related to a topic-specific activity sheet whereby Kenny was learning about his peers' favourite movies. While recording the last of these responses, Kenny shared with me that a boy in his class "likes the Austin Powers movies the most." Though I was quite certain that Kenny's family had watched at least a few of the Austin Powers movies, I was sensing that Kenny had not yet made the connection to his peer's response. At times such as these throughout the intervention, when Kenny was demonstrating that he had not fully understood the language he had heard from his peers, I often relied on using the Internet in order to provide Kenny with visual examples to supplement his comprehension. Today, the timing was perfect because we were going upstairs to use the computer next, to work on making his Talking to Friends prompt sheet for tomorrow at school. So I let

Kenny know that we were going to use the Internet to “learn some more about Austin Powers movies” to which Kenny replied with, “Okay, let’s use Google Images first.”

So that was what we did. As soon as Kenny saw some of the images, he quickly recognized them from the movie cases. We spent a few moments talking about how his older sister likes the Austin Powers movies too, and just to be sure, I asked Kenny, “Are they Brittany’s favourite movies?” Kenny, very matter of fact, replied “No” because, though she likes them, they are not her favourite.

I then also decided to take a moment to use the internet to try to relate this learning we had done about Austin Powers to something salient to Kenny. Because Kenny had full understanding of the language concepts of real, pretend, and character by this time, I visually drew out, in chart form, that in this movie, the character’s pretend name is Austin Powers, but that the actor’s real name is Mike Myers. On the same chart, I provided Kenny with three more examples where I listed the movie, the character’s pretend name, and the actor’s real name. Because they were some of his favourites, I used Tim Allen, Eddie Murphy, and Johnny Depp. To make this more concrete, we pulled out some movie cases so that Kenny could see the actor’s name printed on the DVDs. Last but not least, I then pulled out the case for one of the movies I had brought along with me, Shrek 2. I had bought it one day when Kenny and I went shopping together. I showed Kenny that Mike Myers was also the actor for the pretend character Shrek. Kenny noticed Eddie Murphy’s name as well and made the comment, “Eddie Murphy is the actor pretending to be Donkey.” All of the language was making sense to him.

As Kenny was holding the case of my movie, he also commented, “Michelle likes the Shrek movies” and I replied that I did indeed. I then made a few comments about the

day when Kenny and I had gone to the theatre with his sisters to see Shrek 2. Fortunately, I had remembered to bring the trusty bowl of chips upstairs, because then Kenny asked me “Michelle, do you like the actor Mike Myers?” Grabbing a handful of chips, I praised with “Kenny, I really liked that question. Yes, I like Mike Myers because he is a funny actor.” Then I reciprocated, “Kenny, do you like the actor Mike Myers?” He replied, “Yes. Michelle, which Mike Myers movie do you like the most?” [more chips]. “Shrek 2 for sure. Which Mike Myers movie do you like the most Kenny?” I asked. “Hum... Shrek and Cat in the Hat. I will go ask Brittany and Danielle too.” “Great idea” I told him, “and here are some more chips for asking great questions.”

A few minutes later, we were back at the computer to start making the Talking to Friends sheet for school the next day. With respect to this component of the program, there has again been considerable learning and progress made. Early on, it was quite important for Kenny to write out each of the questions he was going to ask his peers, as doing so served two key functions. First, printing each sentence provided numerous repetitions to practice the structure for asking various Wh- questions. Second, printing the sentence provided Kenny with visual cues, and like many students with autism, Kenny possesses strong visual skills. After he had written out a sentence, he could then rely on his visual memory to help him remember the structure of the language he needed to use.

Using an errorless teaching approach (Barbara, 2007), I began by simply giving Kenny the entire question format verbally. Kenny would print the sentence and I would ask him to practice saying each sentence twice. Because learning to ask various forms of Wh- questions was the target teaching objective during our home sessions, my principal goal was to keep learner frustration low so that Kenny would regard learning how to ask

Wh- questions as positive. Giving him the sentence and only expecting him to print it and then echo my language, during the initial stages of teaching, kept Kenny's frustration down. Then, as time went on, and based on what Kenny would show me he was ready for, I would fade my prompting and only provide him with the first few words of the Wh-question. As he showed success with this level of prompting, I faded down to only providing the first word of the question. By this point, Kenny had practiced many examples of the different Wh- question formats, and after a short time I faded out my prompting completely.

After a few weeks of Kenny independently coming up with the correct question formats and writing out the questions on his TTF sheet, I transferred the skills to using a computer. My reasons were threefold. Writing out questions was quite time consuming for Kenny, so I had, therefore, kept the number of questions down to only three per recess (a total of nine questions) to ensure that the task did not become tedious for Kenny. By switching to the computer, I could increase the number of questions to five or six per recess, resulting in more opportunities each day for Kenny to initiate social contact and to get to know more about his peers. I could also use this program to imbed teaching Kenny a whole host of computer skills related to using word-processing applications. For example, Kenny picked up on the functions of cut and paste very quickly. And third, most students, both with and without autism, enjoy computers and electronics. Because an overall goal was to make the All About People I Know intervention as positive as possible for Kenny, moving the task of creating the visual TTF to the computer felt like an easy way to achieve keeping it fun.

On this evening, Kenny decided that he was going to ask six questions per recess the next day, and also chose to include two special questions at the bottom of the sheet. With quiet independence, Kenny typed out his twenty questions. He based the majority on five different ongoing topic-specific sheets, and would cut and paste when he could. As was often the case, if Kenny found a particular topic highly interesting to him, he would try to sneak in a couple of extra of these questions. Today, the two most common questions Kenny chose to include were the questions related to favourite McDonald's food and whether his peers had any allergies.

Now, some context about the two special questions Kenny chose to add. As highlighted in the ethnographic introduction, it was during the previous school year, when Kenny was in Grade 5, that the school team allowed this intervention to be transferred to school. Prior to that, the intervention was limited to family members and close family friends. The intervention commenced with me selecting a small number of Grade 5 students to start with, a few who had shown genuine interest in Kenny. I also added his two educational assistants, for I was hopeful that making them more familiar and predictable to Kenny would improve the social quality of his daily interactions with both individuals.

For a similar, but slightly different reason, I also wanted to add Kenny's fifth grade teacher right away. Based on observations I had been fortunate to conduct during earlier grade levels, I had seen evidence that classroom teachers were not overly salient to Kenny. As well, if I probed and asked Kenny to tell me his teacher's name, his first response was often the name of his main educational assistant (EA). I felt that it was important for Kenny's classroom teachers to become more meaningful to him, so that one

day he might also be able to attend to them for direct academic instruction, instead of attending to the EA. Again, I was hoping that if Kenny was given a format for getting to know his classroom teachers, he would come to see them as predictable, familiar, and maybe even as valuable and interesting.

In my opinion, this did indeed happen. Kenny not only learned a number of facts about a few of his Grade 5 peers, but he also became much more familiar with his teacher and EAs, using the two page people-specific activity sheets. Very quickly after starting, it was obvious that his fifth grade teacher had become more salient, as Kenny began making a few spontaneous comments about her during his school-day recall program. Logically, when Kenny commenced the sixth grade, an activity sheet for his classroom teacher, Mrs. Daniels, was introduced right away. In the chapter to follow, I include a number of Mrs. Daniels' views on the experience of taking part in Kenny's All About People I Know intervention. I now, however, need to get back to the two special questions Kenny chose to add to his TTF sheet on this particular evening.

A number of weeks prior to the study, during a home-school team meeting, Kenny's mother had taken the opportunity to remind the school team about the importance of allowing Kenny visits to his Grade 7 classroom, a measure to ensure a successful transition in September. Helpfully, the school staff confirmed for Kenny's parents that a woman named Mrs. Johnson would be Kenny's seventh grade teacher. Both at school and at home, Kenny started hearing about Grade 7 and his new teacher, Mrs. Johnson. During one session around that time, Kenny was busy filling in responses on a new topic-specific activity sheet. Truly Canadian, we were learning about which foods his family and friends most enjoyed to eat from the barbeque. Wonderfully, Kenny

spontaneously decided that he wanted to add Mrs. Johnson's name to the activity sheet. For this, Kenny had received praise and two stickers, another of his preferred reinforcers. And taking this as a sign of social interest, I asked Kenny if he also wanted to start an All About Mrs. Johnson sheet, to which he had responded, "Okay."

About two or three times a week for the next few weeks, Kenny would add two questions for Mrs. Johnson, his future seventh grade teacher, at the bottom of his TTF sheet. Today was the same, and Kenny had no trouble independently coming up with the questions he wanted to ask her the next day because both topics were highly motivating to him: favourite internet website and favourite Disney movie. Mrs. Johnson's responses of 'www.kelloggs.ca' and 'Snow White' came during the final minutes of afternoon recess the following day.

It is an interesting phenomenon, the feel, the *buzz*, of an elementary school once June hits. I sensed it the moment I walked through the front door of Kenny's school on the first day of my observations. I could sense it again today. On this day of observation, though, things were a little different. I would only be observing the afternoon portion of the day, as Grade 6 EQAO (Education Quality and Accountability Office) testing had been taking place in the morning. After thanking Mrs. Daniels, the sixth grade teacher, again for allowing me to conduct observation, I made my way down to the school staffroom to say hi to Kenny. I had been informed by his teacher that he was there finishing a baking activity and, when I entered, Kenny was sitting at a table, next to his EA, Mrs. Lowry, eating cucumber slices. I said a quick hello to both, got a quick "Hi Michelle" response from Kenny, and his EA continued with an explanation of how pickles are made from cucumbers, which had been interrupted by my entrance. Kenny

was quiet for a few moments as he listened, and it was a challenge to figure out how much he was understanding, until his EA began talking about some of the various kinds of pickles. As soon as she referred to dill pickles, Kenny spontaneously asked her, “Does Mrs. Lowry like dill pickles?” Quickly, before she could reply, I used a silent pointing gesture to prompt Kenny to improve the wording of his question, and he followed with “Do *you* like dill pickles?” Mrs. Lowry responded that she did, but at this point Kenny then asked her, “Do *I* [emphasis] like dill pickles?” In this case, Mrs. Lowry assumed that Kenny wanted her to ask him the question, and so she did so. He replied, and from there the exchanges moved to asking about liking pickles on hamburgers, and then on to other types of hamburger toppings. The conversation went on for six exchanges, with Kenny both asking and answering preference-based questions, and concluded when Mrs. Lowry stated that it was time to go back to class for lunch.

Because I had been afforded opportunities in the past to observe Kenny at school, my presence was not proving overly distracting to Kenny, for which I was grateful as it allowed social exchanges such as these to occur as they would without me there. When I had a moment to ask Mrs. Lowry how Kenny’s morning had gone, however, she explained that he had been “very distracted and anxious.” She felt it was likely due to the fact that the morning had been different from routine and had been rather unstructured. She also advised me that, because of the EQAO testing, the Grade 6 class had not gone outside for recess and so Kenny had not had an opportunity to ask his TTF questions. Interestingly, when I glanced down at the TTF sheet on Kenny’s desk, he had already changed the numbering of the questions on the page. I was able to figure out that the

numbering reflected a decision he had made to ask twelve questions during lunch recess, the six he was going to ask plus the six he would have asked during the missed recess.

Twenty minutes later, after Kenny had finished eating his lunch, it was time to go outside for recess. All of his peers were already outside and had been there for about ten minutes, and though the classroom was quiet and peaceful, the buzz coming from down the hall said that the school yard was not. At first, Kenny appeared anxious about going outside and asked once if he could stay inside. Calmly, Kenny's EA handed him his TTF sheet (on a clipboard) and then oriented him to their visual schedule. She showed him that he would be going outside for thirty minutes, that he could do his TTF, and that after recess it would then be time for the "Grade 6 special activity." Though I was clueless as to what this meant, it clearly made sense to Kenny and the next moment he was putting on his shoes and cap, ready to go. On the way out, Mrs. Lowry explained to me that because the Grade 6 testing finished that morning, their teacher, Mrs. Daniels, had decided that the class deserved a bit of a celebration, and after recess they were going to have a movie and treats.

In total, it took Kenny approximately twenty-five minutes to ask his twelve questions. When he arrived outside, Kenny looked around and found a couple of the boys he needed engaging in a basketball game. As soon as he walked over, the boys stopped playing and one asked him, "Hey Kenny, are you asking me a question today?" Kenny answered, "Yes" though he needed a bit of time to scan his TTF sheet. Consistent with all of my observations, Kenny's peer demonstrated patience until Kenny was ready with the question. Once he found it, he made great eye contact with Matthew, and maintained it until Matthew responded. As Kenny recorded the response, another boy moved in closer

and asked, “Kenny, can you please ask me a question?” Fortunately, Kenny had a question for this peer too, and showed the same appropriate level of eye contact while asking. However, when a third peer approached, Kenny did not have a question for him. Slightly disappointed, Aidan said, “Make sure you choose me tomorrow, okay,” before walking away.

Next Kenny approached a peer who was in conversation with one of her friends. Kenny did not wait for a break in their conversation before asking Hailey his question, and as a result she did not hear him. After a few moments, Kenny repeated the question with a louder tone of voice and, though he was still interrupting, this time she heard him and responded accordingly. In addition, this was the first peer who reciprocated, asking Kenny about his favourite McDonald’s food in return. Distracted by the task of recording her response onto his TTF sheet, Kenny did not respond and Hailey, too, needed to repeat the question. Kenny quickly replied, with eye contact, and then started to walk away. At this point, Kenny’s EA turned him back around and prompted him to say thanks to Hailey. After he did so, Mrs. Lowry praised him and gave him a Skittle, another of Kenny’s preferred reinforcers. Then she prompted him to look at his TTF sheet to see who he needed to find next.

Nearby, a few other classmates were grouped in a circle. When Kenny approached, he immediately reached out and tapped Kayla on the shoulder to get her attention. Once she had turned around, Kenny posed his question, again making eye contact. After getting her response, he turned to another of the girls to ask her the same question, “What are you doing this summer?” Alyssa did not immediately respond, and Kenny was unable to pick up on the subtle cues that she was thinking about her response.

Impatiently, Kenny said, “What is it?” Alyssa explained that she was still thinking about it, and took a few more seconds to respond. With her response, the small group broke into a conversation about their upcoming summer plans. Even after recording the two responses, Kenny stayed with the group for a couple of minutes. And though he did not join in or make any more eye contact, it was clear that he was listening. When Kenny started to just walk away, again his EA stopped him, and prompted him to say “Bye, girls.” When he did so, Kenny received another Skittle from Mrs. Lowry and was praised for eliciting the expression.

The social interactions between Kenny and the remaining seven peers on his TTF sheet occurred in much the same way as the five described. As stated, it took Kenny approximately twenty-five minutes to locate his peers on the yard and ask them his questions. Just as Kenny was recording the final peers’ response, the school bell rang indicating that lunch recess was over. Kenny carried his clipboard as he and Mrs. Lowry walked into the school. Inside, Kenny hung up his hat and switched to his indoor shoes. As he entered the doorway to his classroom, Mrs. Lowry said, “Kenny you did a great job talking to your friends at recess” and gave him another Skittle. Kenny, however, was not paying much attention to what was being said. He was focused on looking at the television stand that was now at the front of his classroom. Verbally, Mrs. Lowry instructed Kenny to go sit at his desk and he complied.

A few moments later, when the rest of the class had entered and made their way to their desks, Mrs. Daniels, the Grade 6 teacher, announced that, as she had promised, they were going to be watching a movie and enjoying a few treats for the afternoon. She praised her class for finishing the EQAO testing, and stated that she had brought in chips

and carbonated lemonade. She then lifted the movie case and shared with the class that they would be watching the movie *Nanny McPhee*. Kenny sat quietly and attentively at his desk, not looking away from the television screen, as Mrs. Daniels spoke. However, as soon as the movie started, Kenny got up from his desk and walked over to Mrs. Daniels. Spontaneously, Kenny asked, “Mrs. Daniels, where are the chips?” She replied that they were in the staffroom. Kenny quickly followed with “Can I go get them?” to which she responded that the two of them could go and get the chips and drinks. About five minutes later, Kenny and Mrs. Daniels both returned to the classroom carrying boxes. Hers held cans of lemonade which she placed on a desk. Kenny’s box contained approximately two dozen individually-sized bags of chips of assorted flavours.

Though I could continue with my record of the events that came next, in truth, Mrs. Daniels provided me with a wonderful account during our interview together. Her account is provided (p. 73) in the Findings and Discussion chapter to follow, and speaks to the growth Kenny displayed in his theory of mind development and social language functioning. It must be shared, however, that though I chose to provide Mrs. Daniels’ account, I am grateful to have been in Kenny’s classroom to have observed, for myself, those rewarding moments.

Analyses

In total, the three forms of data obtained in this study include interviews with a parent and three educators, peer questionnaires, and the researcher’s direct observations. An emergent, theme-based approach was used in the analysis of the data and provided a descriptive account of the intervention and the progress made by the focal participant in his theory of mind and social language functioning.

CHAPTER FOUR

FINDINGS AND DISCUSSION

Given the qualitative nature of this project, four questions were formulated to guide the analysis of the data:

1. To what extent did aspects of the All About People I Know intervention, such as the focus on choosing questions of high interest to the student and the visual nature of the activities, help motivate Kenny to learn about his peers and their preferences?
2. Was Kenny able to learn the language skills necessary for asking his peers, and others, about themselves through the use of positive reinforcement, visual prompts, practice, prompt fading and high levels of repetition?
3. How did Kenny's classroom peers feel about their interactions with Kenny as he made his way through the All About People I Know intervention?
4. How do adults in Kenny's life perceive his social development and have they noticed qualitative differences in his social interaction?

To begin this final chapter, brief discussions predicated upon the findings pertaining to these four questions will first be provided. This will be followed by a discussion of a number of limitations of the present project. During the analysis of the data, clear thoughts pertaining to teaching-related aspects of Kenny's intervention emerged. Therefore, the chapter will conclude with recommendations directed towards educators for how best to include theory of mind related concepts into the individualized programming received by their students with autism.

Theme One: Motivating Kenny to Learn About His Peers

In their study providing a developmental perspective on theory of mind, Hutchins and Prelock (2008) point out that the use of repetition, visual stimuli, structured activities, and topics that are applicable, are important considerations when motivating students with autism to learn about aspects of social situations. All four of these considerations were attended to during the development of the structure and materials associated with Kenny's All About People I Know intervention. Within the interview data, both Kenny's mother, May, and his EA, Mrs. Lowry, comment on how facets of the intervention helped increase Kenny's motivation to learn about others. May provided the following analogy:

Definitely, the program helped create a motivation, I would say. In that you turned what was for him, this confusing scramble of activity and behaviour and people and words and sounds, and actually made it into a visual that was sort of almost a growing matrix form of information, but which you organized for him. You started small and together built on that organization, similar to how cities are built, you know. And that was very compelling...and that was fun. When you finally understand something and you can look at it and go 'Oh yeah, I get it because I have a picture of it in my mind.' And then you are more interested in the outside world because you're interested in how additional pieces of information fit into the visual matrix you're prepared...That was the motivation that was created, the fact that he wanted to go out and get that information. (p. 7)

Whereas May's comments stress how important it was to use highly structured, visually-based activity sheets, Mrs. Lowry spoke about how critical it was for the questions to be about something that interested Kenny, so that he would be able to relate to his peers:

Now he is excited about asking them his questions. Um, if the question is something that interests him. Because something that he is not interested in, then you're not getting anywhere with it...And I think that we look back and learn that he always relates things back to him. He tries to relate everything to what goes on in his world. It makes perfect sense because that's the way things are for him.

(p. 3)

These findings lend support to the conclusion that it is imperative for interventions designed to support theory of mind development be tailored to the individual with autism, and to consider their unique strengths. In doing so, we help ensure they remain motivated to participate, even on days when, perhaps, autism makes that difficult.

Theme Two: Giving Kenny Language Skills for Learning About His Peers

Early in the first chapter, I shared with readers two simple sentiments which were at the core of my personal goals for Kenny's All About People I Know intervention. First, like Kenny's parents, I held a vision of a boy engaging in social interactions with his peers at school. Second, I felt a responsibility to Kenny, and to his parents, to make an effort to teach Kenny a set of skills so that he would feel successful and safe interacting in his social world.

Based on the literature, I felt hopeful that by concentrating on building language skills, Kenny would be afforded social opportunities that would help him develop theory of mind skills. Golan et al. (2008) stress that typically developing children learn to recognize emotions and mental states through constant interaction with family members and peers, and the reduced levels of social interaction among children with autism may partially account for their slower learning of mental state and complex emotion

recognition. Similarly, Hutchins and Prelock (2008) state that language provides the means by which children become aware of unobservable mental states and argue that children acquire a ToM by internalizing the meanings that are co-constructed during language-mediated social interaction. Therefore, with this focus on needing to teach Kenny language skills, strategies consistent with applied behaviour analysis (ABA) were incorporated, and included the use of positive reinforcement, visual prompts, practice, prompt fading, and repetition. Wonderfully, the data collected supports that through the use of these evidence-based ABA techniques, Kenny was able to learn language skills for interacting with others. Kenny's Grade 6 peers offered these insightful quotes:

I think the most important thing Kenny has learned by this is not about us, but about talking to people (make eye contact, using clear voice, and responding to me). (Peer Questionnaire Respondent #2)

I think the most important thing Kenny has learned is how to communicate with other people. Also how to ask questions properly. (Peer Questionnaire Respondent #3)

I think through out the year Kenny has improved in having a conversation. (Peer Questionnaire Respondent #10)

I think it is good for Kenny to talk to people he knows because it builds his confidence so he can talk to other people with confidence. (Peer Questionnaire Respondent #14)

I think that by Kenny asking questions it helps his social skills. Also he can learn more about us and make new friends and get to know us better. It was also a very fun activity for us and probably Kenny too. (Peer Questionnaire Respondent #18)

In a slightly more quantitative format, 15 out of the 28 peer respondents selected the sentence ‘Kenny talks to me a **lot** more than he did in Grade 5’, in comparison to only 3 out of 28 who selected ‘Kenny talks to me the **same** amount as in Grade 5.’ The remaining peers chose the sentence ‘Kenny talks to me a **bit** more than he did in Grade 5’ as being the most true. Clearly, Kenny’s classroom peers observed changes in his ability to use functional social language. Clear to me, however, is that fact that many members of this sixth grade classroom became active teachers, supporting and encouraging Kenny in his social-language education.

The words of Kenny’s mother, May, also provide strong support for the finding that Kenny was able to acquire language skills necessary for asking his peers, and others, about themselves:

Well first the fact that he is using more speech, more language. Because at school there are so many people there that it’s a wonderful place to be able to use *more* language. So large quantity of language. Also, being able to ask people questions. Before he manded [requested] things that he wanted, but he didn’t necessarily mand [request] for information. So that fact that he’s practicing manding for information from others. And especially information that doesn’t directly affect him. The fact, also, that he is able to ask questions better. He’s able to practice the Wh- words that are associated with questions. Along back to the quantity of talking, the fact that he is engaging more in conversation. The verbal to-and-fro of conversation...all of these things to do with language. Definitely more. And the fact that he is *impelled* to use language. (p. 2)

Together, May's views and those shared by Kenny's peers, confirm the importance for socially-relevant language skills to be targeted somewhat in tandem with teaching theory of mind concepts. In order for Kenny to be able to gain the understanding that others have preferences of their own, he needed the language to be able to ask them about their unobservable mental states. Developments in language are known to accompany developments in ToM (Hutchins & Prelock, 2008), and future research disentangling the relationship between both is needed.

Theme Three: Peer Perceptions About Their Interactions with Kenny

In the third chapter, direct observational data from a sample day during the three week study period was provided. A number of qualitative data points can be drawn from that sample day to support the finding that Kenny's classmates enjoyed the social interactions they were having with him and were eager to take part in his All About People I Know intervention activities. For example, as soon as Kenny walked over to where a group was having a basketball game, the boys stopped playing and one specifically asked if Kenny was going to ask him a question that day. A second boy in the group was also keen to know if Kenny had a question for him, too. Fortunately, Kenny did. However, a third student, Aidan, displayed visible disappointment when Kenny did not have a question for him, and even went so far as to ask Kenny to make sure he chose Aidan the next day.

Throughout all of my observations at the school and on the recess yard, Kenny's classroom peers demonstrated patience whenever he needed it during their social interactions. If they reciprocated with a question of their own and Kenny did not provide a response, they made sure to follow through and repeat the question, rather than allow

Kenny to walk away. This is extremely important when interacting with an individual with autism. The peers also offered high levels of verbal encouragement, and were observed to offer helpful prompting such as “Can you say that a bit louder, Kenny?” or “Keep looking at me.” However, for as informative as direct observations are, it can be argued that they are influenced by researcher bias.

The following quotes, by comparison, provide firsthand accounts of how Kenny’s Grade 6 peers felt about their interactions with him as he made his way through the All About People I Know intervention:

I think it is good that Kenny has been asking us questions at recess. It gives him something to do that he enjoys and he learns about us. (Peer Questionnaire Respondent #1)

What I think about this is it is fine as long as the questions are not personal because I would feel uncomfortable with him asking me those types of questions. (Peer Questionnaire Respondent #3)

I like when Kenny asks me questions because I know every day he asks me a question, he is trying to learn more about me. It feels good inside. (Peer Questionnaire Respondent #5)

I think Kenny has been asking us questions so he’ll be a better friend and so he will get used to us being around him more. (Peer Questionnaire Respondent #12)

I think it was good and pretty neat for Kenny because he gets to learn more about us and if we wanted to know about him we could. I think it was pretty neat because it makes you actually think about that stuff. (Peer Questionnaire Respondent #18)

Evidenced by the quality and importance of the above quotes, one of the strengths of this study was the collection of peer questionnaire data. These quotes, in addition to direct researcher observations, furnish support for the finding that these peers enjoyed participating in Kenny's All About People I Know intervention activities. Perhaps more importantly, when taken together, these findings reinforce an important methodological consideration. That is, researchers are now emphasizing the beneficial outcomes of including peers in social skill and theory of mind programming to promote social interactions between children with autism and peers without disabilities (Feng, et al., 2008). Undeniably, this has significant implications for educators, which will be discussed shortly.

Theme Four: Adult Perceptions Regarding Kenny's Social Development

Similar to the present project, Feng et al. (2008) employed a single participant design to study the effects of a ToM and social skills training program on the social competence of, coincidentally, a sixth-grade student with autism. The overall results indicated that Lang, their participant, engaged in substantially more appropriate social interactions across time and setting and also showed improvements in ToM test scores (Feng, et al., 2008). Within this discussion, interview data will be presented which supports the finding that Kenny, too, displayed meaningful improvements in his social development, and theory of mind functioning, after participating in the intervention.

Two common points made by both Kenny's classroom teacher and school principal was that they had observed dramatic increases in (a) his level of social awareness, and (b) the frequency of his social interactions with peers. Mrs. Daniels, the

classroom teacher, was easily able to provide a number of examples of increased social awareness:

From the beginning of the year to now, he's much more aware of what's going on within the classroom...like in gym...sometimes he will sit out but he's still watching the kids play. In the classroom, he's asking his peers if they are ready to say prayer and he's looking around the room to make sure. (p. 1)

So I mean he's more aware now of the kids when he goes out into the yard...like he's not as apt to wander through their games either because he's more aware of them. (p. 2)

As another example, the day that he went on a field trip and the rest of the class was here and he came in...and we could see him looking around to see who was here and who wasn't. I could see that he was really interested to know who was away and who wasn't...and we would not have seen that at the beginning of the year. (p. 3)

Ms. Richards, the principal, provided a number of comments related to Kenny's increase in social interaction behaviour:

Before, his interactions were all assisted...we needed to prompt him to participate in *any* kind of interaction or conversation. Now, there is more of that initiating and responding in a social interaction...and I would have to say from my observations that, for the most part, he really wants to interact, he really wants to be involved. (p. 2)

Now even the number of questions he asks when he goes out for recess too. I mean, he's asking way more questions now. He gets lots accomplished in a 15 minute recess or in a 25 minute lunch time. It's great. (p. 3)

With respect to improvements in Kenny's theory of mind functioning, Ms.

Richards commented:

To me, Kenny is learning to understand that we all have different preferences, especially when it comes to movies, because that's something he is into... And I believe he is understanding that people have different opinions or feelings on things. It's starting where you can have a conversation about that with him. It's a deeper level of reasoning with him now, because he gets that it's a person's feeling. (p. 5)

As above, due the fact that Mrs. Daniels is able to observe Kenny within her classroom environment, she was able to provide a number of detailed examples of improvements in his ToM functioning:

That day we watched a movie, we had treats and Kenny came and asked me if he could get the chips and the drinks from the staffroom. So I said yes he could get them. And then *he* decided to go around and ask each student what kind of chips they wanted from the selections as he passed them out. Then he passed out the drinks. That was completely him initiating the whole episode. Yeah, I didn't ask him and nobody else asked him. And for him to find out what kind they liked, to use the language 'what kind of chips would you like?' I thought it was really good. And we wouldn't have seen that at the beginning. He would have just grabbed any bag and given it to them, without a word. There's just no way that

that would have happened. I think he asked them what kind they did want because he didn't want to give them a kind they didn't like. (p. 6)

And with Kenny calling staff by their first names, I mean now he's aware that they have first names, he did not understand that before, and now he does because he's asked them his All About People I Know questions. So I think that he's begun calling them by their first name because it's a whole teasing social thing, 'oh, this teacher calls her by her first name...well I'm going to see if I can call her that too.' The teasing is really funny. He's teasing much more, looking for the reaction. (p. 3)

Well the other day Kenny was having a conversation with Mrs. White about her baby grandson. He was asking her questions like does he have this movie or does he like this character. And there had been maybe six or seven exchanges. (p. 5)

The improvements in Kenny's theory of mind functioning, as observed and reported by the adults interviewed, lend support to previous research that ToM skills can be taught to children with ASD (Feng, et al., 2008). Although I feel that it was important that Kenny's All About People I Know intervention included both language-focused and ToM-related instruction, it appears that it was almost equally beneficial that the intervention was structured around Kenny's learning strengths and personal motivations. Additionally, the findings from this project strongly support the importance Feng et al. place on using students' real-life experiences in skill programming.

This chapter began by listing four questions which directed the analysis of the qualitative data collected during the three week study. Through these, four key summary statements can be made. First, the need for ToM related interventions to be structured

around the motivations and strengths of the individual with autism must be underscored. Findings also confirmed the requirement for socially-relevant language skills to be taught simultaneously with ToM concepts. Third, heavily involving the peers of children with autism in their ToM intervention can result in many gains, both for the focal child and for his or her classmates. And finally, in accordance with the overall aim of the project, understanding that meaningful improvements in social development and ToM functioning can be made by individuals with autism when they are provided with appropriate programming.

Limitations of the Project

The overall aim for this project concerned the extent to which teaching theory of mind in a meaningful and concrete manner, specific to one student with autism and his environment, can improve his ToM development and functioning. This project provided a descriptive account of the intervention with the hope that it might aid other professionals and families of children with autism to enhance the theory of mind functioning of children. I ask, however, that readers reflect critically on the information included in this project. A limitation of this project is that it is meant to serve as a descriptive account only, and not as a packaged treatment. For my part, I attempted to provide sufficient detail about the experience of implementing the intervention so that others can benefit from the knowledge gained through this endeavour.

A more significant limitation of the project relates to the issue of the variability in ToM functioning observed across the autism spectrum. A strength achieved by employing a single case study design was that it allowed the intervention duration to be of greater length. However, in the future, it would be best to include additional

participants of various ToM functioning, while still maintaining lengthier intervention duration, to study the effectiveness of the program for those of greater or lesser ToM ability. Quite simply, no two individuals diagnosed with ASD are alike. Therefore, it is hoped that future longitudinal studies will examine the effectiveness of the intervention across a larger sample of individuals. That having been stated, it was not the aim of the present project to pursue this objective. Rather, the main goal was to implement an intervention that worked with one child, such that the result is a net gain for knowledge and for a developing Kenny.

Recommendations for Practice

It is my hope that the descriptive account provided in this project will help to inform educators and other school personnel about methods for implementing ToM interventions in the school environment. As noted by Steiner Bell (1998), the majority of students with autism are taught in mainstream schools and school teams are being asked to meet the highly individualized needs of these exceptional students. A key point to address, however, is that although I hope the findings are helpful to educators, the teaching associated with the intervention was not conducted in a classroom environment. Yet, I feel optimistic that this document will yield valuable insights for educators concerned with enhancing the social functioning of students with ASD for two reasons. First, because Kenny's social interactions with his peers took place in the natural environment of the school, and, second, because viewpoints about the intervention held by three of his educators were reported. With this, it is highly recommended that educators consider including ToM and social language training into the programming received by their students with autism.

On a similar vein, though the literature investigating ToM interventions is still limited, an extensive amount of empirical research has been conducted on the use of applied behavior analysis. In May 2007, the Ontario Ministry of Education released Policy/Program Memorandum No. 140, *Incorporating Methods of Applied Behaviour Analysis (ABA) into Programs for Students with Autism Spectrum Disorders (ASD)*. This document provides clear direction to school boards to support their use of ABA and states that it should be considered an effective instructional approach in the education of many students with autism. Therefore, a second recommendation would be to teach ToM concepts using strategies consistent with ABA. Although many are described in the context of this project, the information is exceedingly limited. Fortunately, in many areas of Ontario, instruction on ABA is now available, though educators are encouraged to seek out high quality training opportunities.

A third and final recommendation to be made also serves to connect the end of this journey to its beginning. Early on, I began by stressing the importance of Relationships. During the analysis of the data, specifically the interview with Kenny's principal, this idea emerged again. She provided the following insight:

When you're a student with autism, building relationships just seems to be so much more difficult. But Kenny, Kenny actually really built relationships with a lot of these kids, and with a lot of us....And I think other people would say that too. (p. 3)

Essentially, the final recommendation is this. See the opportunity to incorporate theory of mind teaching into the daily lives of students with autism, not as an Individual Education

Plan (IEP) outcome, but rather as a vehicle for building relationships, nurturing a sense of community, and fostering true inclusion.

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Appendix A

All About People I Know Intervention Activity

Appendix A includes one intervention document, as described in Chapter One.

All About My Mom !! (Photo of Mother here)

_____ name is _____.

_____ address is _____.

_____ telephone number is _____ - _____ - _____.

_____ has _____ hair and _____ eyes.

_____ middle name is _____.

_____ mom's name is _____.

_____ dad's name is _____.

_____ has _____ brothers and _____ sisters. Their names are _____

_____ has _____ children. Their names are _____.

_____ birthday is _____. _____ is _____ years old.

_____ has _____ pets. The pets are _____

_____ vehicle is a _____.

In the past, Mom went to school. _____ favourite subject was _____.

_____ **3** favourite friends are _____.

_____ favourite sport is _____.

_____ **2** favourite activities are _____

and _____.

Page 2.

_____ favourite _____.

_____ dislikes _____.

Appendix B

Ethics Approval Letter

Appendix B includes the GREB ethics approval letter, as described in the Method section.



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May 5, 2006

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 Faculty of Education
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GREB Ref # GEDUC-274-06

Title: *"Theory of Mind in autism Spectrum Disorders: A Case Study of an Intervention to Teach ToM Concepts"*

Dear Ms. Vieira:

The General Research Ethics Board (GREB) has given approval to your proposal entitled *"Theory of Mind in autism Spectrum Disorders: A Case Study of an Intervention to Teach ToM Concepts"*. In accordance with the Tri-Council Guidelines (article D.1.6) and Senate Terms of Reference (article G), your project has been approved for one year contingent upon receipt of relevant school board approval. At the end of each year, GREB will ask if your project has been completed and if not, what changes have occurred or will occur in the next year.

You are reminded of your obligation to advise the GREB, with a copy to the E-REB, of any adverse event(s) that occur during this approval period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that any adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be approved by the GREB. Examples of required approvals are: changes in study procedures or implementations of new aspects into the study procedures that affect human subjects. These changes must be sent to Linda Frid at the Office of Research Services or fridl@post.queensu.ca prior to implementation. Ms. Frid will seek the approval of the GREB reviewer(s) who originally assessed your application.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, PhD
 Professor and Chair
 General Research Ethics Board

JS/lf

c.c.: D. Klinger and K. Smithrim, Co-Chairs of E-REB
 N. Hutchinson, Faculty Supervisor
 Heather Cross

think Research
think Queen's

Appendix C

CONSENT FORM FOR MOTHER AND FATHER OF FOCAL PARTICIPANT

Researcher: Michelle C. L. Vieira
Faculty of Education at Queen's University

Study Title: Theory of Mind in Autism Spectrum Disorders:
A Case Study Describing an Intervention to Teach ToM Concepts

I agree to participate and have my child participate in the above named study, conducted by Michelle C. L. Vieira of the Faculty of Education at Queen's University.

I have read and retained a copy of Letter of Information and the purpose of the study is explained to my satisfaction.

I have had any questions pertaining to my participation, and the participation of my child, answered to my satisfaction. I am aware that up to 40 hours will be allocated to one-on-one teaching time between the researcher and my child.

I understand that I may be asked to provide documentation pertaining to my child's diagnosis of autism.

I understand that one component of my participation will take the form of an audiotaped interview that will take approximately 45 minutes to complete.

I understand that the researcher may publish the findings of the study.

I understand the participation is voluntary, and that I am free to withdraw myself or my child from this study at any time without negative consequences. I understand that I have the choice to contact the thesis supervisor, Dr. Nancy Hutchinson, by email at hutchinn@educ.queensu.ca should I wish to withdraw or withdraw my child from the study. I can also verbally express my withdrawal wish to the researcher at any point.

I understand that various measures will be taken to protect my identity and the identity of my child.

I understand that there are no known physical, psychological, economic or social risks associated with participation in the research study.

I am aware that I can contact the researcher, Michelle Vieira, at 123-545-6789 or email email@email.ca if I have any questions about this research study. I am also aware that for questions, concerns or complaints about the research ethics of this study, I can contact the Dean of the Faculty of Education, Dr. Rosa Bruno- Jofré, (613) 533-6210, or the Chair of the Queen's University General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081.

I HAVE READ AND UNDERSTOOD THIS CONSENT FORM AND I AGREE TO ALLOW MY SON TO PARTICIPATE IN THE STUDY.

I HAVE READ AND UNDERSTOOD THIS CONSENT FORM AND AGREE TO MY PARTICIPATION IN THIS STUDY.

Name (Please Print): _____

Signature: _____

Date: _____

Appendix D

LETTER OF INFORMATION FOR MOTHER AND FATHER OF FOCAL PARTICIPANT

Study Title: Theory of Mind in Autism Spectrum Disorders:
A Case Study Describing an Intervention to Teach ToM Concepts

Dear <Name of Mother and Father of Focal Participant>:

As you are aware, for a number of months Kenny has been working hard at getting to know his Grade 6 peers, and others, through an intervention program I developed entitled *All About People I Know*. During recess, Kenny asks his classroom peers questions about themselves. These questions are similar to the questions we all might ask as we try to get to know someone new. For example, Kenny has been asking his peers if they have any siblings or pets, what their favourite school subject might be, and what they would like to become when they grow up.

The intent of this letter is to request the participation of you and your son, Kenny Smith, in a three week research study aimed at documenting this intervention for the purposes of sharing it with others concerned with helping students with autism. The one-on-one teaching time I will require with Kenny will total up to 40 hours. This duration is broken down as two hours per day, five days a week, for the three week study period. The goal of this research is to help your son and other children with autism learn skills for interacting in their world. As Kenny's parent, it is important that you are aware that this research has been cleared by the Queen's University General Research Ethics Board.

As part of the data to be obtained for the study, I wish to visit <name of school> to conduct direct observations of Kenny as he interacts with his peers. The observations would take place two or three times a week for a period of three weeks, and would include observing Kenny's social interactions with his peers during recess. Following the three week observation period, I intend to conduct interviews with Kenny's teacher, education assistant, and principal. I am interested to gain their views on the intervention and any observations they may have made of social interactions between Kenny and his classroom peers. As well, I hope to disseminate a brief questionnaire to Kenny's classroom peers, asking them to comment on their social interactions with Kenny.

Specifically regarding your participation in this research study, I would like to request 45-minutes of your time for a brief interview session so that I may gain your views about the intervention and Kenny's social development, at a time and location most convenient for you. It will be necessary for me to audiotape the interview. The taped interview will be transcribed, and then the tape will be destroyed. During the interview, you are not obliged to answer any questions you find objectionable or which make you feel uncomfortable. You will be given the choice to receive a copy of the transcribed interview, for your review, to be sure your views have been accurately recorded.

There is one additional data component I would like to request. That is, it may be of great benefit to the study if I could request use of background information pertaining to Kenny's diagnosis of autism and any further documentation relevant to his development. Should you provide any original documents, copies will be made and the originals returned to you promptly.

Pseudonyms will be assigned to all participants, including you and your son, in order to protect the identities of all participating individuals. All data, including background documentation, will be secured in a locked filing cabinet and your privacy will be protected at all times.

There are no known physical, psychological, economic or social risks associated with participation in this research. Participation in the study is entirely voluntary. You are free to withdraw, or to withdraw your son from the study without reasons at any point, without consequence, and our current working relationship will not be affected. Should you wish to withdraw from the study, you need only verbally express your wish to withdraw, or to withdraw your son, to the researcher. You also have the option to email the thesis supervisor, Dr. Nancy Hutchinson, by email at hutchinn@educ.queensu.ca, to express your wish to withdraw, or to withdraw your son, from the study.

I intend to publish the findings of the study in professional journals and report them at conferences. At no time will the actual identity of you or your son be disclosed and only pseudonyms will be used in publications.

If you consent to participate and to have your son participate in the research study, I ask that you sign the accompanying *Consent Form* and return it to me in the envelope provided at your earliest convenience. Please keep this Letter of Information for your records.

Should further information be required before either you can make a decision about participation, please feel free to contact me, Michelle Vieira, directly at (xxx) xxx-xxxx, or email email@email.ca. I will be happy to discuss any questions you might have. For questions, concerns or complaints about the research ethics of this study, contact the Dean of the Faculty of Education, Dr. Rosa Bruno-Jofré, (613) 533-6210, or the Chair of the Queen's University General Research Ethics Board, Dr. Joan Stevenson, (613) 533-6081.

Yours sincerely,

Michelle C. L. Vieira

Appendix E

PEER QUESTIONNAIRE

Study Title: Theory of Mind in Autism Spectrum Disorders:
A Case Study Describing an Intervention to Teach ToM
Concepts

Dear Grade 6 student:

Thank you for agreeing to fill-in this short questionnaire. I am very interested to know what you think about Kenny's social interactions with you this year. If there are any questions on this questionnaire you do not want to answer it is okay to leave them blank. If you change your mind and decide that you do not want to do this questionnaire, just leave it on your desk until it gets picked up. This questionnaire is anonymous, so you do not need to write your name anywhere on this page. Thanks again!

1. This year in Grade 6, Kenny has been asking you questions about yourself. What do you think about this?

Why do you think this?

2. What do you think is the most important thing Kenny has learned by asking all of you in Grade 6 questions about yourself?

3. Choose the sentence you feel is the most true: (circle one)

Kenny talks to me
the **same** amount
as in Grade 5.

Kenny talks to me
a **bit** more than he
did in Grade 5.

Kenny talks to me
a **lot** more than he
did in Grade 5.

I didn't know Kenny
in Grade 5.

Appendix F

PARENT INTERVIEW GUIDE

Study Title: Theory of Mind in Autism Spectrum Disorders: A Case Study
Describing an Intervention to Teach ToM Concepts

As Kenny's parent, I am very interested in your thoughts and opinions regarding the social intervention *All About People I Know* developed for Kenny. This interview will help me understand your views on differences you may have observed in his social development. Thank you <name> for agreeing to take part. I know that you've already read the Letter of Information and signed the Consent Form, but do you have any other questions before we begin? The interview will be recorded and the tape destroyed once I have transcribed the interview. A pseudonym will replace your name on all data, and all data is being stored in a locked filing cabinet.

1. Have you observed any differences you have observed in Kenny's social development since he began the All About People I Know program? If so, how would you describe any differences you have observed in Kenny's social development since he began the All About People I Know program? *Probe for examples.*
2. How would you describe Kenny's level of motivation to get to know other people, and interact with others, since he began the program? *Probe for examples.*
Can you describe what his level of motivation was like prior to the program? *Probe for one example.*
3. Have you seen any benefits because of Kenny's All About People I Know intervention? If so, what would you say have been the benefits of Kenny's All About People I Know intervention?
4. Please describe any negatives or challenges that have been associated with Kenny doing the intervention.
5. Which elements of the *All About People I Know* program, if any, do you consider were the most important for making this program a good fit for Kenny?
6. How would you describe the reactions of others to Kenny's questions and to his efforts to get to know them? *Probe for examples.*
7. Please share your views on whether you feel Kenny has yet been able to generalize skills learned through the *All About People I Know* program to new situations. *Probe for examples.*
8. The term Theory of Mind refers to our understanding that other people have their own minds and to our ability to infer the mental states of others. For example, if I am watching you open a present and you start to smile, then I would infer that you like the present and therefore feel happy.

One goal of the intervention program has been to develop Kenny's Theory of Mind by teaching him that sometimes when we know about somebody else's preferences we can infer how they will feel about something. Please share any examples you may have observed of Kenny using his preference information to figure out how someone will feel about something.

9. I would like to now ask if there are any other views you would like to share with me, which I may not have asked about in my questions. Please feel free to add anything at all.

Appendix G

SCHOOL STAFF INTERVIEW GUIDE

Study Title: Theory of Mind in Autism Spectrum Disorders: A Case Study
Describing an Intervention to Teach ToM Concepts

As an important member of Kenny's educational team, I am very interested in your thoughts and opinions regarding the social intervention *All About People I Know* developed for Kenny. This interview will help me understand your views on differences you may have observed in his social development. Thank you <name> for agreeing to take part. I know that you've already read the Letter of Information and signed the Consent Form, but do you have any other questions before we begin? The interview will be recorded and the tape destroyed once I have transcribed the interview. A pseudonym will replace your name on all data, and all data is being stored in a locked filing cabinet.

1. Have you observed any differences you have observed in Kenny's social development since he began the All About People I Know program? If so, how would you describe any differences you have observed in Kenny's social development since he began the All About People I Know program? *Probe for examples.*
2. How would you describe Kenny's level of motivation to get to know his peers, and interact with his peers, since he began the program? *Probe for examples.*
Can you describe what his level of motivation was like prior to the program? *Probe for one example.*
3. Have you seen any benefits because of Kenny's All About People I Know intervention? If so, what would you say have been the benefits of Kenny's All About People I Know intervention?
4. Please describe any negatives or challenges that have been associated with Kenny doing the intervention in your school environment.
5. How would you describe the reactions of Kenny's peers to his questions and to his efforts to get to know them? *Probe for examples.*
6. Please share your views on whether you feel Kenny has yet been able to generalize skills learned through the *All About People I Know* program to new situations. *Probe for examples.*
7. The term Theory of Mind refers to our understanding that other people have their own minds and to our ability to infer the mental states of others. For example, if I am watching you open a present and you start to smile, then I would infer that you like the present and therefore feel happy.
One goal of the intervention program has been to develop Kenny's Theory of Mind by teaching him that sometimes when we know about somebody else's preferences we can infer how they will feel about something. Please share any examples you may have observed of Kenny using his preference information to figure out how someone will feel about something.
8. I would like to now ask if there are any other views you would like to share with me, which I may not have asked about in my questions. Please feel free to add anything at all.

Appendix H

A Sample of Intervention Documents

Appendix H consists of three samples of All About People I Know intervention documents. Within Appendix H, the first document to appear is the two-page All About My Friend X activity sheet. This document is peer-specific. The remaining sample documents are intervention documents which are topic-specific. Please note that all visual images have been obtained from publicly available clip art programs.



All About My Friend X !! (Page 1)



_____ name is _____.

_____ goes to school at _____. _____ is in Grade _____.

_____ has _____ brothers and _____ sisters. Their names are _____

_____ birthday is _____. _____ is _____ years old.

_____ has _____ pets. The pets are _____

_____ favourite school subject is _____.

_____ favourite sport is _____.

_____ **2** favourite activities are _____

and _____.

_____ favourite book is _____.

_____ favourite movie is _____.

_____ favourite CD is _____.

_____ favourite computer game is _____.

_____ favourite restaurant is _____.

_____ favourite healthy food is _____.

_____ favourite drink is _____.

Page 2.

_____ favourite _____.

_____ dislikes _____.

"What Do You Want To Be When You Grow Up?"



Doctor



Dentist



Policeman



Fireman



Teacher

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

"What Do You Want To Be When You Grow Up?"

(Page 2)



Veterinarian



Construction Worker



Hair Dresser



Engineer



Soldier

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

In the future, _____ wants to be a _____.

