Exploring an Emotion Intervention for Preschoolers With Autism Spectrum Disorders

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Abstract

The purpose of this multiple case study was 1) to explore the effectiveness of an emotions recognition program for preschoolers with Autism Spectrum Disorders (ASD), and 2) to investigate one parent’s perception of the emotions program. To address these objectives, the emotion unit scores of 7 preschoolers with ASD aged 3 to 5 years old (1 female, 6 males) were graphed and analyzed using visual inspection. In addition, the mother of 1 participant was interviewed to explore her perceptions of the emotions program and emotional learning. Overall, results revealed that participants’ emotion recognition scores increased over the course of the emotions unit. The parent reported improvements in her son’s expression and understanding of emotion, but noted that he continued to have difficulty with regulation of emotion. Implications for theory, education, and future research are discussed.
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CHAPTER 1: INTRODUCTION TO THE STUDY

This study explored a behavioural instructional intervention aimed at improving emotion understanding in preschoolers with Autism Spectrum Disorders (ASD). Given the increase in the incidence of ASD, recent attention has focused on exploring the intervention strategies (Autism Canada Foundation, 2006). Emotion understanding is only one facet of ASD, and although it is a difficult aspect to address, understanding it in children with ASD may provide valuable insight towards improvement in family communication (Kamps et al., 2002).

Although emotional education programs for children with ASD exist, very few have been evaluated (Hadwin, Baron-Cohen, Hill, & Howlin, 1996). Those that have been evaluated have failed to address whether the children are able to generalize what they have learned across multiple contexts such as school and home (Hadwin et al., 1996). At the time of writing, no studies have explored emotional education programs as part of a regular school curriculum rather, they were provided as part of a research study which may have impacted their results.

Background of the Problem

ASD is a complex, multi-dimensional developmental disorder that occurs in approximately 2 to 5 cases per 10,000 individuals (American Psychiatric Association [APA], 2000). ASD includes autism, Aspergers syndrome, pervasive developmental disorders, Rett Syndrome, and childhood disintegrative disorder. The essential features of ASD are impaired development in social interaction and communication, and a restricted repertoire of activities and interests (APA, 2000). The impairments in social interaction are prominent and may include such problems as difficulties with nonverbal
behaviours (e.g., eye to eye gaze, facial expressions, body postures, etc.), failure to develop age appropriate peer relations, and lack of emotional reciprocity (APA, 2000). The impairments in communication may include difficulties with verbal and nonverbal skills. Some children with ASD may not develop language at all, and those who do may be delayed or show impairment in the ability to initiate and sustain conversations with others.

Other communicative difficulties include the use of a stereotyped, repetitive, or idiosyncratic language (APA, 2000). Children with ASD may be preoccupied with a particular interest such as baseball statistics. They may also show repetitive behaviours such as lining up objects or mimicking another individual (APA, 2000). Some children with ASD have an associated diagnosis of developmental delay, while others perform at normal level or higher. ASD is 4 to 5 times more common in boys than girls, and is onset prior to 3 years of age (APA, 2000).

Emotion understanding difficulties are a key feature in the definition of ASD according to the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2000). Emotion understanding is a complex multifaceted developmental process that is comprised by three hierarchically organized components (Harris, 1989). The first occurs at approximately 4 years of age and requires one to identify emotional expressions and understand that external factors cause emotion. The second stage involves understanding that emotions result from an individual’s beliefs and desires. This requires an understanding of mental states and usually occurs around 6-7 years of age in normally developing children (Harris, 2000). Finally, an understanding of complex (jealousy, pride, shame, etc.) and mixed emotions are acquired which requires a level of cognitive
reflection and usually occurs around 8-9 years of age (Harris, 1989). Emotion understanding is just one facet of emotional competence. Emotional competence requires a child not only to understand emotions, but also to be competent in expressing and regulating emotions (Denham, 1998).

There is evidence of deficits of facial, vocal, and gestural expression of emotion in children with ASD (Silver & Oakes, 2001). Research has also shown that children with ASD usually find it difficult to predict or read people’s emotions based on their beliefs and to match different modes of emotional expression, such as facial expressions, gestures, vocalizations, and contexts (Hadwin, et al., 1996). Celani, Battachhi, and Arcidiacono (1999) claim that people with ASD have normally developed perceptual strategies and can observe emotional cues, but may lack a holistic understanding of emotion and its meaning. For example, they are better able to sort pictures of individuals to identify them than they are at sorting pictures by emotional expressions.

The ability to express one’s emotion is an important sociocommunicative skill. Our facial expressions are a means of expressing our mental states, and in turn solicit others to respond (Kasari & Sigman, 1996). For example, mothers are motivated to respond differentially to positive versus negative facial expressions of their infants (Huebner & Izard, 1988). Children also adapt their behaviour to the facial expressions of others (Izard & Malatesta, 1987). Thus it can be seen that the expression of emotion plays a crucial role in behaviour, and any disruption in this system can have a deleterious effect on social interactions. For children whose emotional expressions are different than normally developing children, this is particularly true. For example, a delay in smiling may cause a mother to interact less with her child (Field, 1980). Differences in
expressive behaviour (for example, facial expressions that do not fit the situation) may cause difficulty in a caregiver’s ability to understand the child’s expressions (Kasari & Sigman, 1996). So it can be seen that delay and differences in expressive behaviour may affect the interactive behaviours of the social partner with possible long-term effects (Kasari & Sigman, 1996).

Purpose of the Study

The purpose of this multiple case study was to explore and describe the effectiveness of an intervention program aimed at teaching preschoolers with ASD to identify facial patterns of basic emotions. The present study aimed to further discourse on whether it is possible to teach children with ASD to develop levels of emotional competence. If indeed the instructional intervention is successful, the children will learn to recognize and label faces of basic emotions and generalize what they have learned to other situational contexts. A long-term goal of this study is to help researchers and clinicians to assess and evaluate current interventions to facilitate learning of emotion in young children with ASD.

Research Questions

This study will explore the following questions:

1. With targeted direct instruction will preschoolers with ASD learn to recognize and discriminate four basic emotions in others and self as indicated by data on trials to criteria?

2. Will parents of the children receiving this intervention observe emotional recognition in their children within their home environment?
Rationale

Although research on preschoolers, emotion understanding is increasing (Bosacki & Moore, 2004), few studies have explored the issues of emotional development in children with ASD and to what extent teaching emotions influences emotional development including emotional understanding. Most research in this area has tended to focus on cognition or behaviour as opposed to emotions (Swettenham, 1996; Swettenham, Baron-Cohen, Gomez, & Walsh, 1996; Wellman et al., 2002). Studies that have looked at emotions specifically tended to be either single case study approaches (Stafford, 2000) or were carried out in a laboratory setting as opposed to part of a regular curriculum (Hadwin et al., 1996). Furthermore, to date, no studies have investigated parents perceptions of the impact of the program.

Scope and Limitations

This study explored a lesson unit on emotions designed to instruct young children with ASD to recognize four basic emotions in self and others. The participants in the study were preschool-aged children who had previously been identified as having an ASD. The small sample size presented a limitation, as the study lacked the statistical power to generalize the findings to the larger population. In particular, a small number of parents were interviewed (n=1), and future research should include the whole family including parents, siblings, caregivers, etcetera. Furthermore, it was beyond the scope of this research study to explore the influence of sociocultural factors, or gender differences due to the nature of the sample.
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CHAPTER TWO: REVIEW OF THE LITERATURE

Since Kanner's (1943) first description of Autism, the disorder has become a well researched topic. Since then, our knowledge of ASD has gone from a belief that ASD developed from a cold and detached parenting style, to the understanding that ASD is a serious developmental disorder with a biological basis (APA, 2000; Frith, 1989). The link between emotions and ASD has long been understood, as it is a salient feature of the disorder.

The purpose of this chapter is to review the literature and identify issues related to the development of emotion as an aspect of social competence.

Autism Spectrum Disorders

Kanner (1943), an Austrian-American psychiatrist, was one of the first to write a medical description of ASD. He commented about one of the children in his care, noting that, "Her expression was blank, and she made no communicative gestures; she had no real contact with the persons in the office" (p. 240). Other descriptions of emotion in children with ASD have ranged from the apparent absence of emotional reaction, to extremes of emotion in a way which is quite inappropriate for their age and the social situation (APA, 2000).

Frith (1989) was among the first to develop the theory of mind hypothesis to explain many of the difficulties of children with ASD. Theory of mind, sometimes called mental state understanding, or mentalizing/social reasoning, refers to the ability to infer mental states (beliefs, desires, intentions, imagination, emotions, etc.) that cause action, or the ability to reflect on the contents of one’s own and others’ minds (Frith, 1989). According to Perner (1988), theory of mind first allows one to represent concrete objects...
and events, followed by the ability to attribute first order representations of mental states to oneself and others. This further develops into the ability to attribute second-order representations of mental states; for example, "she thinks that he thinks the chocolate has been moved."

Baron-Cohen, Leslie, and Frith (1985) performed an experiment and learned that most children with ASD do not develop theory of mind as normally developing children do. This lead to the hypothesis that children with ASD’s theory of mind deficit accounts for their social and communicative deficits.

Theory of Mind and ASD

The most common task used by theory of mind researchers is the false belief task (Frith, 1989). One of the most frequently used false belief tasks is the Sally-Anne task, a story in which Anne watches Sally put a marble into a basket, and Sally goes for a walk. Meanwhile, Anne takes the marble from the basket and puts it into a box. The child is asked where Sally will look for her marble when she comes back. The child must realize that Sally still believes the marble is where she left it and that she will search for it there. Many studies have explored theory of mind in children with ASD, and have had varied findings.

One of the first studies on theory of mind and children with ASD was by Baron-Cohen, Leslie, and Frith (1985). The study demonstrated that participants with ASD were significantly impaired in comparison to typically developing and developmentally delayed children on false belief tasks. Twenty children with ASD were tested on the Sally-Anne task and results showed that 80% of children with ASD failed to appreciate Sally’s false belief. In contrast, 86% of Down Syndrome children succeeded on this task.
This seminal study was the first of many to demonstrate the lack of mentalizing ability among children with ASD.

First-order false belief tasks such as the Sally-Anne task involve inferring another person's mental state. Wimmer and Perner (1983) demonstrated that typically developing children as young as 4 years old could keep track of how different people may think different things about the world. For example, in interpreting well-known stories such as *Snow White*, 4-year olds would respond to a picture of an old woman handing Snow White an apple having been read the script: "Snow White *thinks* the old woman is giving her a nice juicy apple. She doesn’t *know* that it’s really her wicked stepmother all dressed up and that the apple is poisoned!" (p. 5). Research has demonstrated that children with ASD have trouble changing their perspective to understand that of others, and instead report on their own knowledge (e.g. Baron-Cohen, Leslie, & Frith, 1986).

To test if children with ASD had difficulty attributing mental states to the dolls used in the Sally-Anne experiment, Leslie and Frith (1988) conducted another study, this time acting out a false belief scenario themselves. Similar to past research (Baron-Cohen, Leslie, & Frith, 1986), most of the participants (15 of 21) failed the task. Furthermore, some of the children predicted incorrectly as to where the actor would look for the hidden object, and also indicated that this is where she would think the object was. Thus the participants did not understand that, in this case, to see is to know and not to see is not to know (Leslie & Frith, 1988).

This finding was further elaborated using other similar tests such as the Appearance/Reality test, sometimes known as the Smarties test (Perner, Frith, Leslie, &
Leekam, 1989). In this case, a tube- which is well known to British children as a Smarties candy container- was filled with a pencil. The children expected Smarties to be inside the tube, and were disappointed when a pencil fell out. When they were asked what a new child being tested would think was inside the container, 80% of children with ASD incorrectly responded “a pencil.” The children did not realize that someone else would have made the same error that they did in thinking there would be Smarties in the tube. The failure rate on this task among children with ASD again illustrates their poor mentalizing ability.

In sum, the previous experiments suggested the following findings: 1) Most children with ASD fail at first-order false belief tasks; 2) Children with ASD understand others are able to see but fail to understand that others can think/know/believe; and 3) Children with ASD cannot understand the perspective of others even though they themselves have been in the other’s perspective. Given these results, researchers explored the question of how it is possible to know that mentalizing is a unique kind of logic that can be weak or absent in able children with ASD while other conventional logic is intact. To answer this question, Baron-Cohen and colleagues invited the same participants as in their (1985) Sally-Anne experiment to participate in another study. The children with ASD had to first put a series of pictures in order so as to make up a story, with the first picture already in place. Second, they had to tell the story in their own words. There were three types of stories: a mechanical story, a behavioural story, and a mentalistic story. As expected, the children with ASD placed the mechanical and behavioural stories in correct order, and described them perfectly. However, this was not the case with the mentalistic stories, as they put the pictures in an incorrect order. Both
typically developing children and children with Down Syndrome performed better than
the children with ASD on mentalistic stories, in both ordering and describing the stories.
They performed less well on the mechanical stories, and approximately equal on the
behavioural ones. These results showed that children with ASD can better understand
stories with nonsocial mechanics, about equally understand behavioural stories, and are
poorer at understanding stories involving inter-personal psychology compared with
normally developing children and children with Down Syndrome (Baron-Cohen, Leslie,
& Frith, 1986).

All of the studies reported above involved first-order tasks that included inferring
one person’s mental state. Although the majority of children with ASD failed these tests,
a small number did pass. To test whether this theory of mind deficit was universal,
Baron-Cohen (1989) tested children’s abilities on second-order false belief tests. Second-
order tests involve considering embedded mental states (i.e. She thinks that he thinks
that…). None of the children with ASD passed second-order false belief tasks.

The results from these studies provide evidence for the hypothesis that some
children with ASD had difficulty when asked to make judgments that are taken as
evidence for the acquisition of a theory of mind. Thus, some children with ASD have
difficulty in understanding mental states in self or others compared to normally
developing children (Tager-Flusberg, 1992). It has been argued that this mentalizing
deficit accounts for problems in communication and in making sense of the social world
among children with ASD (Baron-Cohen, 1988; Frith, 1989). Interestingly, in the few
studies where children with ASD passed first-order false belief tasks, the participants
were diagnosed with milder variants of ASD such as Asperger’s (Hughes, Soares-
Boucaud, Hochmann & Frith, 1997; Prior et al., 1998). This supports the hypothesis that children diagnosed with ASD experience difficulty with theory of mind or social understanding (Hughes & Leekam, 2004).

**Emotional Competence and ASD**

Given that theory of mind involves the understanding of beliefs and desires including emotions, some researchers claim that the link between theory of mind and emotion understanding is inextricably intertwined (e.g. Dunn, 1995). Because of this it is difficult to know whether deficits in theory of mind ability cause difficulty in emotional competence, or vice versa. Emotions can be categorized as simple- for example, happy or sad- and complex- for example, proud or embarrassed (Bosacki & Moore, 2004). Simple emotions are based on physiology, whereas complex emotions require the ability to self-evaluate against internalized standards of behaviour (Bosacki & Moore, 2004). If children are unable to attribute mental states in themselves or others, they would likely have difficulty in recognizing emotions in people’s facial expressions. To understand the role of emotions in ASD, one must first understand emotions in typically developing children.

Theory of mind involves the ability to represent the mental states of others. We know that children with ASD have severe theory of mind impairments, and that theory of mind plays an integral role in emotional competence. Therefore, children with ASD provide a unique opportunity to explore the relationship between theory of mind and emotional competence.

Although it is difficult to draw conclusions about the ability of an individual to identify his or her own emotional experiences, it is possible to explore the issue by
looking at an individual's ability to attribute emotions to others. Research on emotion attribution in children with ASD shows that they can appraise, and potentially experience, at least the emotions of happiness and sadness but are less successful at attributing complex emotions such as pride and embarrassment (Capps, Yirmiya, & Sigman, 1992). Given their impairment in theory of mind, children with ASD have difficulty appraising emotional situations in which knowledge of the mental states of the protagonists is important (Baron-Cohen, 1991).

Given the complex process of emotional development, various theoretical models attempt to explain children's emotional understanding. For example, Greenspan (1992) provides a model of emotional development that integrates maturational patterns with environmental factors (caregivers, community, and culture) and examines how they work together through each developmental phase. In the first level, children show the ability to attend to affective experience while organizing a calm and regulated state. They have the ability to display shared attention and engagement. In the second level, children demonstrate two-way communication in that they are able to enter into a cause and effect interaction. They should be able to engage in an emotional, social, and intellectual dialogue. In the third phase, children exhibit pretend play and can use representations to understand their world. For example, they may use phrases such as "me sad," or "me mad." In the fourth phase, children are able to use emotional thinking to categorize their experiences. They are able to conceptualize a sense of space and to understand what is me and what is not me, what is inside me and what is outside me, what is reality and what is fantasy and they are able to distinguish self from others (Greenspan, 1992).
More recently, Denham (1998) organized emotional competence into three components: expression of emotion, understanding of emotion, and regulation of emotion. In an emotionally competent child, these three components work together in an integrated way. Goleman’s (1995) book titled Emotional Intelligence drew attention to the consequences of lacking emotional competence, as well as the benefits of being emotionally competent. An emotionally competent person exhibits self-control, zest, sympathy, perseverance, and social acuity.

Competence in expression of emotion involves four main skills: 1) using gestures to express nonverbal emotional messages, for example giving a hug; 2) showing empathy toward others’ emotions, for instance kissing a child’s hand after he or she scraped it; 3) demonstrating complex social and self-conscious emotions, such as guilt, pride, shame, and contempt; and finally 4) understanding that an individual may appear to be demonstrating a particular emotion on the outside, but may be experiencing a different emotion on the inside, such as a child who is afraid of an adult visitor but does not show it visibly (Denham, 1998).

According to Denham’s (1998) model, an individual who is competent at understanding emotion demonstrates: 1) an ability to discern one’s own emotional states, for example realizing feelings of sadness rather than anger after given a time-out; 2) an ability to discern other’s emotional states, such as recognizing that a smile indicates happiness; and finally 3) using a vocabulary of emotion, for instance talking about feelings of sadness after the death of a grandparent (Denham, 1998).

Emotion regulation according to Denham (1998) involves: coping with aversive or distressing emotions, for example telling a teacher rather than resorting to aggression
when dealing with conflict in the school yard; coping with pleasurable emotions, such as controlling one’s laughter despite gleeful feelings while playing tag; and finally, strategically “up-regulating” the experience and expression of emotions at appropriate times, for instance singing out loud while sharing enjoyment with a best friend (Denham, 1998).

Children with ASD are known to have difficulty with emotional competence (APA, 1994). Specifically, children with ASD show a lack of awareness of the feelings of others, little or no facial expressiveness for communication, distress over slight changes in the environment, and abnormal comfort seeking in times of distress (Denham, 1998).

In one early study of emotional competence in children with ASD, twins were videotaped at 4 months of age (Kubicek, 1980). The original purpose of the study was to explore emotional competence, but the opportunity arose when one of the twins was later diagnosed with ASD. Researchers noted some interesting differences between the twins. The twin with ASD lacked eye contact, and displayed neutral facial expression and rigid posturing. Also, the twin with ASD lacked the normal affective reciprocity evident in the typically developing twin’s interactions (Kubicek, 1980).

A second study compared the home movies of children with ASD with typically developing children at their first birthday (Osterling & Dawson, 1994). The children with ASD differed from the typical children in that they looked less to others, seldom showed or pointed to objects, and failed to respond to their names. These two studies show that affective differences from infancy may distinguish children with ASD from typically developing children.
Past studies have found that children with ASD display happy, sad, angry, and neutral facial expressions at similar frequency to age-matched controls, however they are more likely to display these affects in inappropriate contexts (McGee, Feldman, & Chernin, 1991).

Children with ASD have been shown to smile less during interactions with their peers, and in these settings, they are less likely to coordinate expression of affect with eye contact (Lord & Magill-Evans, 1995). They also show more incongruous blends of emotions (for example, joy and sadness), compared with nondelayed children who in one study showed an absence of incongruous blends of emotions (Yirmiya, Kasari, Sigman, & Mundy, 1989). These results all point to qualitative rather than quantitative differences in the expression of emotion of children with ASD, meaning that although they express emotion, they are often inappropriate to the situation. As Denham (1998) puts it, “Although they are able to express emotions, autistic children’s deficits in joint attention and sensory integration make it difficult for them to learn when to show specific emotions” (p. 192).

In one study that examined the responses of 3- to 6-year-old children with ASD to adults showing negative emotions of fear, distress, and discomfort, children with ASD were developmentally matched to mentally challenged and typically developing children affect (Sigman, Kasari, Kwon, & Yirmiya, 1992). The adults were asked to act out one of three situations: the first where a robot entered the room and the mother and adult experimenter displayed expressions of fear; the second where the child was exposed to distress in the mother when she hit her finger with a pounding toy and pretended to cry; and the third in which the mother feigned illness by moaning on a sofa during a play
episode with the child. While there were few affective responses in any of the three groups of children, typically developing and mentally challenged children were attentive to the adult’s expressions in all three conditions. This was in contrast to the children with ASD ignoring the adults’ display of negative affect (Sigman, et al., 1992). This study also speaks to the emotion regulation of children with ASD in that they spent significantly less time looking at a distressed or fearful adult than did the other groups. The children with ASD tended to look at the pounding toys that resulted in the adults’ injury rather than the adults themselves. They showed latency in approaching the robot, and they did not visually attend to the adults’ display of fear. Thus, the children made use of emotional information to guide their own behaviour, but in a detached nonsocial manner. The children with ASD showed a different idea of what was important in the situation.

Hobson (1986) hypothesized that children with ASD lack emotional competence because they are unable to recognize others’ facial expressions. He asked children with ASD, developmentally delayed, and normally developing children to match drawn and photographed facial expressions with a videotaped person demonstrating gestures, vocalizations, and contexts corresponding with the four emotions. Results showed that participants with ASD were markedly impaired in matching facial expressions to the videotapes compared with control groups.

To uncover whether children with ASD generally show less attentiveness to facial features than typically developing children, Weeks and Hobson (1987) gave children with ASD, mentally challenged children, and typically developing children photos to sort on the basis of gender, age, type of hat, or facial expression. When comparing the children’s
sorting strategy, mentally challenged and typically developing children sorted the photos by facial expression, whereas the children with ASD sorted by type of hat. Their findings suggest that children with ASD do not view facial expressions as particularly salient.

The complex or secondary/social-moral emotions include embarrassment, guilt, empathy, and pride. The development of these emotions requires certain cognitive prerequisites; for example, pride develops once a child has a sense of self separate from others and can reflect on his or her own performance relative to some standard (Kasari & Sigman, 1996).

In contrast to the understanding of simple or primary/basic emotions, few studies have addressed complex emotions in children with ASD because of the emotions cognitive complexity. However, one study of empathy has been reported on high functioning adolescents with ASD (Yirmiya, Sigman, Kasari, & Mundy, 1992). This study explored descriptions of what emotions adolescents with ASD experienced after viewing a video clip designed to elicit empathic responses. Overall, the adolescents with ASD were less accurate and were consistent with the cognitive and linguistic abilities of typically developing children.

Another study that looked at the complex emotions of children with ASD examined pride (Kasari, Sigman, Baumgartner, & Stipek, 1993). In this study, children were administered two developmentally appropriate puzzles to complete and were praised when they completed the second but not the first puzzle. Children with ASD smiled when they completed the puzzles, as did typically developing children; however, children with ASD did not look up, or draw others’ attention to their accomplishment. In fact, the children with ASD showed avoidant responses, meaning they withdrew and did
not seek approval for their success. Although it is impossible from this study to conclude that children with ASD did not experience pride, the degree to which it is socially mediated may differ for children with and without ASD.

Overall, children diagnosed with ASD tend to have difficulty with emotional competence. Their emotional expressions lack contextual appropriateness, and they pay less attention to others' emotional states. They also seem to lack ability to understand others' emotions. They show less development in terms of regulation of emotion and the complex emotions compared with typically developing age-matched peers.

Although the majority of research indicates that some children with ASD experience difficulties in emotional competence, some research studies have found contrasting results. For example, Prior, Dahlstrom, and Squires (1990) failed to replicate Hobson's (1986) findings, using the same experimental paradigm. Also, Baron-Cohen (1991) found that children with ASD were able to understand simple emotions resulting from situations or events, although they were impaired in their ability to understand the more complex emotions. Due to these inconsistencies, further research with longitudinal data is required.

Theory of Mind, Emotion Understanding, and ASD: Intervention Studies

To understand the theory of mind and emotional competence difficulties of children with ASD, several researchers have attempted to teach children to understand emotion concepts. Hadwin et al. (1996) were among the first to attempt to teach children to understand mental states. Thirty children between the ages of 4 and 13 years with ASD and with expressive language were the participants in the study. Specifically, the researchers targeted three areas of difficulty for teaching: understanding emotion,
understanding belief, and pretend play production. The participants were randomly allocated to one of the three experimental groups (emotion, belief, or play). The children were taught in one of these three areas only. The aim in this was to explore whether teaching one area of mental-state understanding would have positive effects for understanding in areas where no teaching was given.

Pre-testing consisted of assessing children’s understanding of belief and emotion concepts, and their level of play was also recorded. The teaching phase consisted of teaching in half-hour sessions for 8 consecutive days, or until criterion was met. Happy, sad, angry and afraid, were the emotions that were focused on. A post-test was conducted on the day after teaching finished, and then again 2 months later to examine teaching effects over time.

Results of the study showed that some children with ASD passed some emotion and belief tasks. Children learned to pass simple tasks and proceed onto more complicated tasks, and they maintained this knowledge 2 months later. Furthermore, their scores were not adversely affected by the introduction of novel materials. However, there was no evidence to support that children generalized their learning to a wider range of tasks. For example, a child in the emotion-understanding group did not necessarily improve his or her score on the belief understanding or pretend playgroup following the intervention. That is to say, improvement in understanding one area of mental-state understanding did not generalize to other untaught areas of mental-state understanding, despite the researchers efforts to simplify the material and to provide general principles from which to abstract. Children also did not show significant improvement in spontaneous pretend play.
Although Hadwin et al.'s (1996) study yielded interesting results, there were several methodological flaws. First, they had neither a control group of normally developing children, nor a clinical group other than ASD. It would be relevant to ask how results would differ for these groups, if at all. Second, the children were tested only in an experimental setting. It would be interesting to measure whether the concepts of emotion and belief understanding made an impact on their functioning in other contexts, such as at home or school. Some research suggests that passing theory of mind tasks leads to improved social skills in typically developing children, (Astington & Jenkins, 1995; Frith, Happe, & Siddons, 1994) and it would be worthwhile to determine whether this is also true for children with ASD. Also problematic was the short duration of the teaching phase of the program (10 consecutive sessions). There is some evidence to suggest that children who are taught mental-state concepts over a longer period of time (such as part of school curriculum) have better outcomes. Hadwin et al. (1996) suggest that this may be an area of future research, to determine whether mental state concepts taught as part of a regular school curriculum would affect outcomes.

Swettenham (1996) sought to improve on Hadwin et al.'s (1996) study, by using computers to teach false belief to preschoolers with ASD. Computers are thought to be useful for children with ASD because they do not involve social factors, are consistent and predictable, and allow children to take active control of the task at their own pace (Swettenham, 1996). Three groups of participants were used: children with ASD, children with Down Syndrome, and typically developing children. Participants were matched as closely as possible for verbal mental age. Children were included in the study only if they failed false belief tasks, but were able to pass true belief tasks. The true
belief tasks were similar to the Sally-Anne task, but this time Sally looks for the ball where it really is.

A computerized version of the false belief task was used to attempt to teach false belief tasks to the participants. Close transfer and distant transfer tasks were used following the study to determine whether the children learned the concepts. It would be possible to pass the Sally-Anne tasks using a strategy but not necessarily understanding false belief. Therefore, distant transfer tasks were used to determine whether the children understood false belief in other scenarios. Distant transfer tasks involved the same paradigm as the Sally-Anne task, but a different presentation of the story. Results showed that children with ASD and typically developing 3-year-old children scored a similar number of correct trials on the false belief task during training; however, children with Down Syndrome achieved significantly fewer correct trials. In other words, children with ASD learned to pass false belief tasks just as well as normally developing children matched for verbal mental age. All three groups passed the close transfer tasks, and no significant differences were found between the three groups on these tasks. However, the children with ASD scored significantly less than both the 3-year-olds and the children with Down Syndrome on the distant transfer tasks. In fact, none of the children with ASD were able to pass these tasks. At a 3-month follow up, there was no change from post-test for the close transfer tasks or distant transfer tasks. Consistent with Hadwin et al.'s (1996) study, children with ASD were not able to generalize what they learned in the false belief training to other false belief tasks.

Swettenham (1996) suggests that the inability of children with ASD to generalize false belief tasks in other contexts may indicate a deficit in central coherence. By this
theory, individuals with ASD are hypothesized to have an impairment in their ability to extract meaning in context, and a tendency to process local rather than global information (Swettenham, 1996). This may apply to all areas of difficulty for children with ASD, including theory of mind. In that case, children may have been able to understand false belief in the Sally-Anne task, without a true understanding for false belief.

Swettenham’s (1996) study produced some useful findings for the teaching of theory of mind. First, it showed once again that children with ASD have difficulty in generalizing knowledge and learning mental states. Given this fact, he suggests that it may be useful to teach children with ASD to apply knowledge in a wide variety of situations. Perhaps the teaching of a useful strategy would be a more effective intervention, which could be applied to a wide variety of theory of mind situations. Unfortunately, this study taught the false belief concept over a short duration, and may have been more effective if it was taught as part of a larger curriculum.

More recently, and particularly relevant to the present study, Stafford (2000) used a single case study design to attempt to teach emotions to a low-functioning child with ASD. This research was unique because the participant was extremely low functioning and nonverbal, and also because it incorporated the emotions unit in the child’s regular curriculum with the teaching phase taking place over a 6-month period. The child was enrolled in a one-to-one, behavioural intervention program, modeled after Lovaas therapy. The premise of behavioural intervention was to shape the child’s behaviour to maximize success and minimize failure, done by simplifying requests and building on them. A token economy system was used as well to reinforce successful responses.
The participant was a 9-year-old male diagnosed with classical autism; researchers gave him the pseudonym, Paul. As he was nonverbal and had poor verbal imitation, visual aids and written words were used to communicate. He was enrolled in a school for children with special needs, and also received 18 hours per week (2.5 hrs per day) of one-to-one Lovaas behavioural intervention. In brief, Lovaas behavioural intervention, called Applied Behaviour Analysis is based on shaping behavior through reinforcement of successive approximations, prompting and fading procedures, and use of positive reinforcers that are child-specific and functional (Lovaas & Smith, 2003).

In the teaching phase, photographs Paul’s mother and his three tutors (who had worked with him for 1 to 2.5) depicting four different emotions (happy, angry, sad and surprised) were used. A communication board with Velcro fittings was used to place the questions; Paul was then allowed to study the photograph(s) and asked to place a word card for each of the four emotions on the Velcro board. There were three teaching phases of increasing difficulty. The first two stages were prior to the 6-month-long teaching phase. Phase 1 took place over 1 week and involved simple matching. Phase 2 consisted of complex matching, and took place over 2 weeks. The first two stages lasted until it appeared that the participant was confident in discriminating between the photos according to the expressions, and was showing concentration on the photos. In the third and final teaching phase, Paul was asked “how do they feel,” and the words “how do they feel?” were placed on his communication board, along with a photograph of someone displaying a facial expression. Paul had to look at the photo and judge the emotion, place the correct emotion word card (which was read to him) on the response strip, and then match the photo with an identical photo which was labeled with the correct emotion at
the side of the board. At first, only an identical photo would be present to provide Paul with a clue. After the first 2 weeks, an identical photo would no longer be available, and word labels were present instead. When the first photo was introduced, only the correct word card was available to maximize success, which is standard to behavioural intervention. Over time this was no longer necessary, as he was instantly able to identify the emotion.

In the testing phase, Paul was tested for whether he could generalize the learnt emotions to novel photographs both of familiar people and randomly selected strangers. Over a period of 10 days, the novel photographs were randomly mixed in with the usual previously learned photographs.

Results showed that over a 6-month period, Paul was able to learn the emotional expressions through photographs of familiar people. As the teaching phase went on, it took less time for him to master new photographs. In the beginning it took him 10 days to master a new photograph, and by the middle of the teaching phase, he was able to master them in 2 days with 90% accuracy. During the testing phase, Paul was able to correctly identify the correct emotional responses of novel photographs.

Interestingly, Paul was able to master the emotion surprise as competently as he was able to master the other simple emotions. This was unexpected because surprise is considered a complex emotion by some researchers, as it has been found to involve looking at both the eyes and the mouth, as opposed to just the mouth in more simplistic emotions, and is a belief-based cognitive emotion (Baron-Cohen, Spitz, & Cross, 1993). Few studies have looked at training complex emotions to children with ASD, particularly not low-functioning children with ASD, and this one was successful in doing so.
Although this study was successful in teaching emotion recognition to a low-functioning, non-verbal, 9-year-old male with classical autism, the authors suggest that it does imply an emotion specific deficit for children with ASD because of the time taken to build up his repertoire (6 months). It is suggested that a control group of typically developing children would have been able to master the emotion photographs more quickly that Paul had they been included. However this study did not incorporate a control group of either typically developing children, or children with other developmental delays such a Down Syndrome, and thus such comparisons cannot be drawn. It was also pointed out that by using nonstandardized photographs of emotion, some ambiguity may have existed in the photographs; however, this was done to be consistent with other aspects of the behavioural intervention that included photographs of familiar people, therefore maximizing success.

Although this study is unique and provides insight into emotion recognition for children with ASD, it utilized a single case study design, making generalization to other populations difficult. It also used a single modality technique (static photographs) to teach the emotions to the participant. This may have encouraged the use of an emotionally neutral strategy, where using cross-modal techniques (e.g. video, audio tape, etc.) reduce that possibility. Perhaps a more realistic view of emotions would be possible using other strategies, making results viable in the “real-world.” According to Stafford (2000), the emotions are continually practiced within Paul’s behaviour intervention, but have not been incorporated in other aspects of his life, such as at school or during his free time at home. She points out that it would be beneficial for him to be able to express his emotions more competently, however the emotions program did not utilize an expressive
component. Also, this study did not utilize a follow up, to determine whether he was able to retain the information learned.

In an attempt to teach children a strategy to help them solve theory of mind problems, Swettenham et al. (1996) developed the notion of conceiving the mind as a camera. Specifically they attempted to teach children with ASD that "the eye is like a camera and people have pictures in their heads" (p. 75). This was intended to build on the research of Leslie and Thaiss (1992) and Leekam and Perner (1991), who found that most children with ASD are unable to understand that a person’s belief can differ from reality, but most could understand that a photograph can differ from reality. Swettenham et al.’s (1996) study aimed to teach children that mental state representations are just like photographic representations.

The study involved 8 children diagnosed with ASD, who had verbal mental ages between 5- and 6-years old, and who failed the Sally-Anne and Smarties task. The researchers were not attempting to develop a normal theory of mind in the participants, rather they aimed to equip them with a prosthetic device for solving theory of mind tasks, much like the blind use brail (Swettenham et al., 1996). They were taught over a period of 5 consecutive days, with sessions lasting 40 to 60 minutes. A four-stage teaching phase was implemented where the experimenter used a life-size mannequin (Sally) with a slot cut in her head to place Polaroid photographs and demonstrate the strategy of the picture in the head. All 8 of the children were able to understand that when Sally looked at an object, she placed a photograph inside her head, and that this photograph does not change if she did not see the world change. However they were not able to spontaneously use this strategy when the experimenter did not use the mannequin to
demonstrate Sally’s thoughts and actions to solve false belief tasks. They were also not able to use the strategy to infer mental states to Sally, when asked what she thought she would see when an object had been moved behind a screen. Seven of the 8 participants were however able to use the strategy to link the photos to action. They were asked to predict action using the photograph in Sally’s head using the following script:

“Sally places object X in location A. Sally ‘takes a photo’ of ‘X in A’ [the photo is inserted in Sally’s head]. Sally leaves, keeping the photo of ‘X in A’ in her head. Anne enters and moves X from A to a different location, B” (Swettenham et al., 1996, p. 83). He or she was then asked “What photo does Sally have in her head?” (p. 83) If the child answered this question correctly, they were told “If Sally wants to find X, she will go to the place in the photo where X is. Where will Sally look for X?” (p. 83).

Four post-tests were used to determine whether the children were able to generalize the strategy to other theory of mind tasks. They were able to pass the Sally-Anne false belief task, the Smarties task, and the seeing leads-to-knowing task, where one character touches a box, and the other looks in the box; the child is asked which one knows what is in the box. They were not however able to pass an appearance reality task, where an object such as an egg is really a sponge. Overall, the children were able to generalize the “photo in the head” strategy to pass three of four theory of mind tasks, and could understand the link between the photos and action to make behaviour predictions, but could not use the photos to infer mental states. It is postulated by the researchers that because children with ASD have a specific difficulty in representing the mind, they are only able to make the link between photo and action, but could not carry out the
intermediary stage of substituting a photo for a mental state. However, because they were able to pass the seeing leads to knowing task, they had to develop the notion of the mental state of knowing. Perhaps a partial grasp of mental states was provided by the strategy.

Swettenham et al.'s (1996) study provides promise to an otherwise unsolved puzzle. If children with ASD could be taught to use a strategy to compensate for the inability to solve theory of mind tasks, improvements may be seen in symptoms such as social abnormalities. However, the study had several critical limitations. In the pre-and post-test Sally-Anne task, the researchers asked only behavioural questions (e.g. where will Sally look?) despite the fact that in training they were taught about both behavioural predictions and attributions (i.e. what will Sally think?). They failed to conduct a follow-up study, thus whether the information learned was retained is unknown. They also used a relatively small sample size (8 participants) and conducted the study over a short period of time rather than implementing it into the children’s regular special education curriculum.

Extending on Swettenham et al.’s (1996) study, Wellman et al. (2002) used a pictorial analogy- thought bubbles- to provide a strategy for children with ASD to understand theory of mind tasks. It was thought that this was a more natural way of depicting thoughts, particularly because they often occur in comics, cartoons, and children’s books.

Ten children diagnosed with ASD between the ages of 5 and 17 (verbal mental age ranged from 4- to 8- years old) were the participants. Children were administered four pre-tests: the Sally-Anne task using cardboard figures, a change of location false
belief task, a Smarties false belief task, and a seeing-leads-to-knowing task. The same four tests were used as post-tests as well.

The teaching phase took place during 30-minute sessions, over 5 days. Six stages of increasing difficulty were presented to the child, with question and answers at the end to ensure comprehension. In stage 1, the notion that when people look at things, they think about things, and the notion that a thought bubble indicates someone is thinking was introduced. In stage 2 the idea that people can think about things that they cannot see was introduced. In stage 3, children were taught that a person’s thoughts are dependent on what they have seen, so that if something changes, but a person does not see it change, their thoughts stay the same. In stage 4, children were taught to predict the location of hidden objects using thoughts bubbles. In stage 5, participants were taught to predict the location of hidden objects that had been moved. Finally, in stage 6, the Sally-Anne task was presented without thought bubbles.

Results showed that similar to Swettenham et al.’s (1996) study, children who used the thought-bubble strategy increased false belief understanding. In fact, they showed better generalization on post-tests, with 80% correct responses on post-test performance. Unlike Swettenham et al.’s (1996) study, children who learned the thought-bubble strategy were significantly successful in answering thought questions even when the thought bubbles were no longer available.

Wellman et al. (2002) suggest that the success of the thought-bubble teaching program was based on creative tailoring to a child’s skills, preoccupations, and limits, as well as on teaching persistence. It was also noted that it was most difficult to teach the 2 youngest children in the study who although had comparable verbal mental ages to the
others, showed less well-developed abilities to attend to instruction. Wellman et al. (2002) suggested that rather than teaching a strategy for understanding theory of mind, focusing on improving a child’s joint attention may be even more important in his or her ability to improve theory of mind ability (Swettenham et al., 1996).

Similar to Swettenham et al.’s (1996) study, Wellman et al.’s (2002) study failed to utilize a control group. It also did not include follow-up data, and used a relatively small sample size. It also remains to be seen whether strategies such as thought bubbles, or pictures-in-the-head, are effective in real life situations, which warrant further investigation.

Summary

Researcher’s understanding of ASD has developed significantly in the past 20 years from being a complete enigma, to a better understood and defined disorder. As ASD is such a complex puzzle, researchers will continue to be challenged by its intricacies. Theory of mind research has shown that children with ASD do not develop theory of mind in the same way as typically developing children (Baron-Cohen, Leslie, & Frith, 1985). Researchers have continued to explore the theory of mind of children with ASD, and have learned that children with ASD fail first-order false belief tasks compared with typically developing children and developmentally challenged children (Baron-Cohen, Leslie, & Frith, 1985). Furthermore, they have difficulty with taking the perspective of others even if they themselves have been in the other person’s position (Leslie & Frith, 1988).

Some researchers contend that the concepts of theory of mind and emotional competence are inseparable (e.g. Bosacki & Astington, 1999; Dunn, 1995). Just as
children with ASD have difficulty with theory of mind, so do they have difficulty with emotional competence. While they may display and possibly understand the basic emotions of happiness and sadness, they are more likely to express these emotions at inappropriate times. They have a great deal of difficulty with the complex emotions of pride, shame, and jealousy.

Less research has focused on whether it is possible to teach the concepts of theory of mind and emotions to children with ASD. Such research mostly noted that the children have problems generalizing the concepts to contexts other than those that they were taught in. Children with ASD appear to be able to learn to pass false-belief tasks, but whether they actually understand the paradigm behind the tasks remains to be seen. What has been shown to be effective is to provide instruction over a relatively long duration, and to provide children with a strategy for how to pass false-belief tasks rather than focusing on the tasks themselves.

The Present Study

This study was designed to describe how current methods in evidence-based practice may be used to instruct children with ASD to learn how to identify, label, and recognize four basic emotions in others and self. It aimed to build on past research in several ways. First, in contrast to a laboratory experiment, the present study addressed emotional competence through instruction as part of an individual educational program (IEP) implementation. Second, to determine the effectiveness of the program in other contexts such as the home, the present study explored one participant’s parent’s perceptions of the program and the child’s emotional development. Finally, the majority
of past research has focused on school-aged children, and little is known about our ability to teach emotion recognition to preschoolers.
CHAPTER THREE: METHODOLOGY AND PROCEDURES

The following chapter will describe the methodology and procedures used in this study. Specifically, the research design, participants, data sources, limitations, and ethical considerations will be discussed.

Research Design

In this study, a mixed methods research design was used to explore the use of an emotion instructional intervention for preschoolers with ASD. A multiple case study design was utilized to provide an in-depth understanding of the unique and complex nature of each participant. Multiple case designs use each individual participant as both the control and experimental participant (Kennedy, 2005). The epistemological basis of multiple case designs lies in behaviour analysis, whereby the research is used to understand why individuals behave in a certain way as opposed to mathematical averages of groups of individuals (Kennedy, 2005). Such research designs explore why individuals do certain things, and then test whether other individuals behave in similar ways under similar conditions, and if not, then why not (Kennedy, 2005).

Specifically, this study combines both multiple case study and multielement designs. According to Creswell (2002), a case study design is useful when multiple cases are used to provide insight into an issue. Multiple case studies are also useful for examining patterns in specific individuals as well as groups of individuals. Multielement designs alternate between conditions in order to show a differentiation between two or more conditions. In this case, participants' abilities on multiple tasks were analyzed for within-case effects.
Participants

The participants in this study were 7 children (6 males, 1 female) with diagnoses of ASD, and 1 mother of a child with ASD. The children were enrolled in inclusive educational settings where part of their programming consisted of an emotion unit. The participants resided in a city in southern Ontario, and family backgrounds reflected varying socioeconomic status. They were of varying verbal abilities, however English was their first language and they ranged in age from 3- to 5-years old. Prior to their enrollment in the study, a wide variety of assessments had been performed thus, information regarding their demographics, families of origin, academic abilities, and so forth was readily available. (See Table 1-Participant Description).

As the principal author of this research served as a volunteer with the centre where the program was organized, a signed confidentiality agreement allowed access to participant files. Number codes were assigned to each case file to respect the children’s confidentiality. Written consent of the participating children’s parents were obtained before being contacted by the principal investigator of this study. All children who had adequate information (i.e., had completed at least one section of the emotions unit) in their files were admitted in the study.

Procedures

Ethical approval was obtained from both the Brock University Research Ethics Board, and the host health institution’s Research Ethics Board.

A few weeks following the completion of the intervention, the primary caregiver of one of the participants was interviewed. Following the interview the
Table 1

Participant Description

<table>
<thead>
<tr>
<th>Name</th>
<th>CARS score</th>
<th>Severity of disorder</th>
<th>Gender</th>
<th>Age</th>
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<tbody>
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<td>moderate/mild</td>
<td>male</td>
<td>3 yrs 8 mos</td>
</tr>
<tr>
<td>James</td>
<td>34.5</td>
<td>moderate</td>
<td>male</td>
<td>3 yrs 3 mos</td>
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<tr>
<td>Leanne</td>
<td>43</td>
<td>severe</td>
<td>female</td>
<td>3 yrs 3 mos</td>
</tr>
<tr>
<td>Joel</td>
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<td>unknown</td>
<td>male</td>
<td>3 yrs 3 mos</td>
</tr>
<tr>
<td>Bradley</td>
<td>unknown</td>
<td>unknown</td>
<td>male</td>
<td>3 yrs 5 mos</td>
</tr>
<tr>
<td>Robert</td>
<td>unknown</td>
<td>unknown</td>
<td>male</td>
<td>unknown</td>
</tr>
<tr>
<td>Mark</td>
<td>35</td>
<td>moderate</td>
<td>male</td>
<td>5 yrs 2 mos</td>
</tr>
</tbody>
</table>
participant was debriefed (see Appendix E). Given that the participant declined the use of audio tape, detailed field notes were taken during the interview. The field notes were then transcribed and returned to the participant for a member check. Several small changes were corrected from the transcript based on the member check.

The transcript was coded according to the method described by Creswell (2002). The transcribed text was coded for themes following Denham’s (1998) categories of emotional competence (understanding, expression, and regulation of emotion). The use of codes borrowed from technical literature was acknowledged by Strauss and Corbin (1990): “In using them, you may contribute beyond your own study to add to the development of concepts that are of importance and concern within your own discipline or profession” (p. 68). Examples of each of the three categories were highlighted on the transcript using different colours of ink, then organized into three separate documents. This approach provided a theory based structure upon which to organize the parents’ perceptions concerning emotional competence.

Data Sources

Secondary use of data was used for several reasons. First, to ensure psychological safety to the participants, it was crucial for the resource teachers to conduct the emotions unit as the children were familiar with their teachers. Second, this study aimed to give a realistic view of an emotions program already in use in a preschool, rather than in a contrived lab setting. Finally, it was impractical due to the geographic distribution of the participants.

The emotions unit implemented in this program (Rahn, Malatest, & Albanese, 2003) was generated with reference to the work of Zelazo, Carter, Resnick, & Frye
(1997) who, like Hughes and Russell (1993), have raised the possibility that executive function may be related to errors in reading social context involved in theory of mind. In their conceptualization of executive function, Zelazo et al. (1997) describe executive function as a function of which problem solving is an outcome. They confirm that knowledge concerning a task is important but that knowledge use depends upon executive function and the formulation of a rule to apply it. This perspective suggests that assisting individuals with ASD to acquire knowledge about emotion may assist them in applying such knowledge and developing a rule for doing so.

Zelazo et al. (1997) provide an example of how this might work in their discussion of executive function and card sorting. To perform correctly on the card sorting task, one must first develop a representation of the problem in context, then select a plan (for example, sorting according to shape). After selecting a plan, one must hold it in memory long enough for it to guide one’s thought or action and execute the behaviour. Carrying this plan into action forms a rule. Following this action, one must appraise one’s behaviour by evaluating for errors and correction based upon the rule (Zelazo & Muller, 2002).

The lesson plan developed by Rahn et al. (2003) followed a similar logic to assist the child with ASD to set down knowledge to assist executive control functions in relation to others and themselves. The assumption was that knowledge of emotion and reading emotion are weak due to the general lack of interest in people of children with ASD (APA, 2000). The use of Direct Instruction (DI) with its prompting techniques supports executive-function processes by assisting retention of information in working
memory and excluding miscellaneous distracters. Thus, the specific logic of the lesson plan unit was as follows.

The first lessons used graphics of each emotion to emphasize and set down knowledge of salient patterns labeled as a face with the descriptor label of happy, sad, sad-cry, and angry. The conjecture was that this would give the children the specific knowledge to problem-solve the discrimination task or to implement a rule for deciding whether the pattern was happy, sad, sad-cry, or angry. These rules for each pattern would then guide them to problem-solve the next task of increased difficulty—matching the correct graphic to the correct photo of a real face of that emotion. Having adapted the rule to real faces, the lesson set was designed to have the child use the rules derived from the previous lessons to solve the problem of applying them to self-image by using a mirror (Rahn, Malatest, & Albanese, 2003).

General Procedures: Focal Session Programming

Each child received 20-30 minutes of DI as a part of their daily preschool schedule. The schedule was generated for the student according to the child’s Individual Education Plan (IEP) completed by the child’s teacher and resource teacher in discussion with the child’s parent(s). Both the teacher and resource teacher were Ontario Certified Early Educators. The content of the DI sessions contained developmental goals generated from the child’s IEP. These goals contained preschool curriculum concepts such as colour and shape as well as goals from what Rahn (2003) referred to as the “Autism Spectrum Disorder Curriculum” which may include such behaviour as attention (to a social partner), turn-taking (with a social partner), and social-skills development.
Each of the DI lessons of the emotions unit was designed according to DI guidelines. Thus each lesson was comprised of a task analysis containing several hierarchical steps. Each lesson step was taught to criteria before starting the next one until all steps of the lesson were completed. The criteria required that the child respond 90-100% correctly on a step across 5 consecutive days. Each child progressed through this procedure at his/her learning rate. The process of generalization of the learning to other activities within the child’s daily schedule was then initiated. Generalization progressed as follows: within the instruction session with different materials, cues, and people; outside the instruction session with different materials, cues, and people; within the home environment through teacher communication with parents (Rahn, Malatest, & Albanese, 2003).

Before presenting the Emotions Unit, each child had reached criteria on attention, turn-taking, response behaviours ("point to," "touch," and "give me"), colour, shape, and body parts which included facial features of nose, mouth, and eyes. Social reinforcement was the only category of reinforcer provided to each child upon a correct response. The social reinforcement was verbal ("Yes, that is a happy face!") or paired with a token (a happy face) placed on a small chart in view of the child (see Appendix C).

**The Emotions Lesson Unit**

The lesson plans were designed to teach the simple emotions of happy, sad, sad-crying, and angry. The emotions were selected in consultation with preschool teachers and parents. In the first set of lessons, the children are taught to recognize the facial patterns of happy, sad, sad-crying, and angry using graphics (Appendix C). During the next set of lessons ("Match-to-Real-Face") the children are taught to match the graphics
of happy, sad, sad-crying, and angry to real photographs (Appendix C), including pictures of family members which were taken especially for this phase of the emotions unit. In the final set of lesson plans Mirror, the children are taught to direct attention to his or her own facial features and make a face indicating happy, sad, sad-crying, and angry faces. The child and instructor take turns in doing this.

Instruction: The Emotions Unit

During the acquisition phase of learning, each facial pattern for each emotion was taught using one stimulus distracter (another emotions graphic) as a part of the visual stimulus presentation. Once all four emotions were taught to criteria, discrimination trials for each facial pattern were carried out using all four facial patterns. All stimulus positions were changed after each trial in all conditions of the instruction to avoid position effects and specific learning effects in the students with ASD. When the children reached criteria on these discrimination trials, a final set of discrimination trials was presented in which all four facial features were presented and the child had to point to or give the instructor the emotion selected at random from a stack of emotion cards (graphic faces). Children who had verbal expression abilities were prompted to say the verbal label when the card was selected. After discrimination trials were completed to criteria, the recognition of the four graphic faces were generalized to other preschool contexts using structured teaching principles and the next set of lessons, Match-to-Real-Face, was introduced.

In the Match-to-Real-Face lessons, the child was instructed to match the graphic of happy, sad, sad-crying, and angry faces to the photograph representing the same emotion. The procedure was similar to the first set of lessons with each emotion being
taught to criteria, and then discrimination trials were also taught to criteria. Generalization to other contexts within the child care centre (e.g., facial expressions of emotion of other students, characters in story books, etc.) were then initiated and the final set of Mirror lessons were introduced.

In the Mirror lessons, the procedure used in the first and second set of lessons was used again. Each emotion was taught to criteria, then discrimination trials also were taught to criteria before the process of generalization was initiated to other contexts within the child’s childcare centre. After the child had reached criteria for all emotions with the mirror, the mirror was gradually faded out of the sessions so that the child was correctly making the appropriate facial expression for sad, sad-crying, and angry without a mirror. After the criteria were met, these behaviours were generalized over other contexts of the childcare centre. This generalization included turn-taking the “Emotions In The Mirror Game” and the “Emotions Game” (no mirror) with peers.

The lessons were designed to minimize failure and maximize success, thus the children were interrupted if they made an error and prompted toward the correct response. Four levels of prompts were used: positional, gestural, partial physical, and full physical. Positional prompts are at the lowest level and involve the resource teacher placing the work materials closer to the child. Gestural prompts are the next level and involve the resource teacher pointing to the pictures or work materials. The next level of prompts are partial physical and involve the resource teacher leading the child at the elbow to match the requested emotion. Finally the highest level of prompts is full physical where the resource teacher will use hand over hand assistance with the child to match the requested emotion. In the event that a child made a mistake on one of the
lessons, the resource teacher would interrupt, and use the prompt level needed to ensure a correct response.

Primary Caregiver Interview

Several weeks following the completion of the emotions unit, the principal investigator interviewed one child’s primary caregiver in the family home. The participant was debriefed immediately following the interview and was also provided with a follow-up thank-you letter. The interview script was adapted from Denham’s (1998) scale of emotional competence (see Appendix D). Specifically, the participant was asked to elaborate on any changes she had noted in the child’s behaviour at home since he was enrolled in the emotions unit. In particular, she was asked to speak to her child’s emotional responsiveness, caring for others, expression of emotion, use of emotion language, and so on, compared with his behaviour prior to the instructional emotion intervention.

Emotions Unit

Scores on the emotions unit were calculated by adding the number of correct responses over 10 trials each day. They were then graphed using Excel. These graphs were analyzed by a process of visual inspection. The process of visually inspecting graphic data is a very powerful way of revealing functional relations (Kennedy, 2005). The use of graphs to analyze data has been well documented throughout history. For example, B. F. Skinner utilized this method of data analysis in his seminal work, The Behavior of Organisms (1938). In this case, visual displays of data were the primary method of data analysis. Graphic displays are prominent in behaviour analysis today because of their flexibility, ease of use, and assistance in visualizing functional relations.
(Kennedy, 2005). More recently, Hetzroni and Tannous (2004) used visual inspection of graphs to determine the effectiveness of computer facilitated communication for children with ASD.

Graphs were analyzed for within-participant differences. There are three elements involved in analyzing graphs for within-participant effects level of the data, pattern of the data, and variability (Kennedy, 2005). Level of the data refers to the average of the data within a condition and is typically calculated as the mean or median. Evaluating the level of the data within a phase allows for the estimation of the central tendency and allows for a comparison of patterns (Kennedy, 2005). Trend of the data refers to the best-fit line that can be placed over the data. Trend has two elements that must be evaluated together—slope and magnitude. Slope is the upward or downward slant or inclination of the data within a phase. A positive slope indicates that data points increase in value, whereas a negative slope indicates a downward pattern of the data. Magnitude is a qualitative estimation and refers to the extent of the slope. A high magnitude slope is a rapidly increasing or decreasing data pattern, whereas a low magnitude slope is a gradually increasing or decreasing pattern in the data (Kennedy, 2005). The final dimension of visual inspection is variability, which refers to the degree to which the data points are dispersed relative to the best fit straight line.

Limitations

Research with small numbers of participants have numerous limitations. Such studies do not have the statistical power to generalize to a larger population, and thus must be interpreted with caution (Creswell, 2002). The participants had different diagnostic categories of ASD; thus, their disorders varied in severity. Sociocultural
influences could not be explored due to the nature of the sample. Also, the program was administered by different resource teachers in different locations and there may have been an influence of the teacher’s instructional style despite standardization of lessons. As this study involved secondary use of data, it was not possible to administer a pre-test, post-test design which is the ideal method of evaluating an intervention (Creswell, 2002). Unfortunately there were inconsistencies in the data available for each of the participants as this data was not in their files. Ideally CARS scores would be utilized for the entire sample, however they were only available for some of the participants. It was also not possible to ensure a random sample of participants as they were selected for the researcher.

Ethical Considerations

This study was approved by the Brock University Research Ethics Board, and a host health institution Research Ethics Board (see Appendices A & B). There were no potential risks to the children involved in the study, as the emotions unit was part of their regular preschool curriculum and was provided regardless of their participation in the study. The resource teachers administering the program were not aware of the children’s involvement in the study, as the data were collected prior to the study’s inception. The names of the participants were removed from the data, thus confidentiality was ensured. There was no risk of harm to the child’s primary caregiver who was interviewed. Pseudonyms were assigned both to the children and to the parent to further protect their privacy.
Summary

The overall goal of this study was to describe and explore an emotion intervention to determine its effectiveness for preschoolers with ASD. This study aimed to determine whether the program was effective and to explore children’s primary caregivers’ perceptions of how the emotions unit influenced their children’s emotional understanding at home. This descriptive aspect to the study was to provide a “thicker” description of the participants compared to a “thin” description offered by a clinical case study (Geertz, 1973).

By using a multiple case study, multielement design, this study aimed to provide an in-depth understanding of the emotion unit’s influence on the participants’ emotional learning and thus provide some insight into the participating children’s emotional education.
CHAPTER FOUR: PRESENTATION OF RESULTS

This multiple case study described and explored whether a program designed to teach emotions to preschoolers with ASD was effective. A combination of quantitative and qualitative measures was used, which was analyzed using a multielement design. The findings are organized as follows: 1) participant profiles and within-case analysis, and 2) content analysis of main caregiver interview.

Participant Profiles and Within-Case Analysis

As the emotions unit was administered individually and by different instructors, there was some variation between participants. Therefore, it is appropriate to examine each child separately.

Description of Participant-Jonathan

Jonathan is a 3-year, 8-month-old, male. He has a diagnosis of Pervasive Developmental Disorder (PDD) and was classified in the moderate/mild range of the Childhood Autism Rating Scale (CARS). He lives with his mother and father who both are his biological parents. His parents are self-employed or own their own business. He has an older brother who is 6-years old and does not have a psychiatric diagnosis. He does not have a co-morbid medical or psychiatric diagnosis. English is his first language and no other language is spoken in the home. His expressive language skills are emerging, and he articulates words and uses gestures to communicate.

Scores on the Assessment of Basic Language and Learning Skills are rated on a Likert scale of 1 to 5. Results revealed that he scored best (5/5) on Cooperation with adults, Requests, Motor Imitation, Vocal Play, and Vocal Imitation subtests. He scored 4/5 on the Receptive and Labeling subtests. He scored 3/5 on the Conversational Skills...
subtest, and 2/5 on the Social Interaction, Letters and Number, and Receptive Language subtests.


Emotions Unit-Jonathan

Jonathan did not complete the entire emotions unit. A baseline score on labeling emotions of real photographs was available, as well as a complete lesson of the matching emotions in the mirror.

Match-to-real face lesson.

To obtain a baseline score of Jonathan’s ability to label the emotions of real photographs, he was asked to randomly label all four emotions. On the first trial he correctly labeled 10/10 (100%) of the emotions accurately over 10 trials, though he required four verbal prompts. On the second trial he was again able to correctly label 10/10 (100%) of emotions and did not require any prompting.

Visual inspection of Jonathan’s Match-to-real-face lesson graph (Figure 1) revealed a mean score of 10. The trend of the data is flat in slope and low in magnitude. There is low variability of the data.
Figure 1. Match-to-real-face lesson-Jonathan
Mirror-lesson.

In step 1 of the mirror lesson, Jonathan was asked to look at the instructor who was modeling a happy face. He successfully labeled the emotion 8/10 times (80%) on the only trial. In step 2 he was asked to make a happy face himself in the mirror. He was able to do this 10/10 times (100%) but required one partial physical prompt (see Figure 2). In step 3, he was asked to look at the instructor who was making a sad face. He was successful 10/10 (100%) of the trials. His instructor noted that he was making the sad face along with her. In step 4, he was asked to make a sad face in the mirror. He was successful 10/10 times (100%) over one trial, but required one gesture prompt. In step 5, Jonathan was asked to watch his instructor making a crying face. He was correct 9/10 times (90%) over one trial. In step 6 he had to make a crying face in the mirror and was able to do so 9/10 times (90%) over one trial. In step 7 he was asked to look at his instructor making an angry face. He correctly labeled the emotion 8/10 times (80%) over one trial. In step 8 he was asked to make an angry face in the mirror. He was correct 10/10 times (100%) over one trial. In step 9 he was asked to look at his instructor who randomly made all four emotive faces in the mirror. He correctly identified the emotions 9/10 times (90%) over one trial. On the 10th and final step, he was asked to make all four emotions in the mirror at random. He was successful 8/10 times (80%) over one trial.

Anecdotal comments of the instructor written on the session recording sheets showed that Jonathan used both index fingers placed at the sides of his mother when imitating the requested emotion. Sometimes he would pull on the corners of his mouth to
help himself make the requested emotion. When imitating the crying emotion he would rub his eyes and make a sobbing sound.

Visual inspection of the graph of Jonathan’s mirror lesson showed an average score of 9.1. The trend of the data is flat, with low magnitude. There was a medium level of variability.

*Description of Participant-James*

James is a 3-year, 3-month-old male. He has a diagnosis of PDD and is classified at the moderate range of the CARS. He lives in a midsized southern Ontario city and attends a childcare center. He is an only child. English is his first language and no other languages are spoken in the home. His expressive language skills are emerging, and he utilizes some words and gestures to communicate. There are no co-morbid psychiatric or medical diagnoses.

His language skills were assessed using the Assessment of Basic Language and Learning Skills. His top scores were on the Cooperation with Adults and Vocal Imitation subtests, where he scored 5/5. On the Motor Imitation, Receptive, and Letters and Numbers subtests he scored 4/5. On the Vocal Play and on the Conversational Skills subtests he scored 3/5. On the Requests and on the Receptive Language subtests he scored 2/5. Finally, he had the most difficulty with the Social Interaction subtest scoring 1/5.

On the Vineland Adaptive Behaviour Scales, he had a standard score of 56 on the communication subtest, 53 on the daily living skills subtest, 56 on the socialization subtest, and 55 on the motor skills subtest. Overall these results yielded a composite standard score of 51.
Figure 2. Mirror-Lesson- Jonathan.
Emotions Unit-James

A baseline was taken on James’s ability to label the emotions of real photographs. A complete lesson of the emotions in the mirror unit was available for analysis.

Match-to-real-face lesson.

To obtain a baseline score of James’s ability to label emotions of real pictures he was asked to randomly label photographs depicting all four emotions. Figure 3 shows that he was able to do so accurately 10/10 times (100%) over two trials without any prompting.

Visual inspection of James’s match-to-real-face lesson graph revealed an average score of 8. The slope of the graph is positive with high magnitude. There is a medium level of variability of the data.

Mirror-lesson.

Figure 4 illustrates James’s scores on the matching emotions in the mirror lesson. In step 1, James was asked to identify his instructor’s happy face. On the first trial he was successful 10/10 times (100%), though he did require two partial physical prompts. On the second trial, however, he was able to do so 10/10 times (100%) without the assistance of a prompt. In step 2, James was asked to make the happy face in the mirror himself. On the first trial he was able to correctly imitate the happy face 5/10 times (50%), and required one partial physical prompt. On the second trial, however, he was able to correctly imitate the happy face 100% of the time without any prompting. In step 3 James was asked to identify his instructor’s sad face. He was able to do so 10/10 times (100%) over one trial. In step 4 he was asked to make the sad face in the mirror. He was able to do so 10/10 times (100%) over one trial. In step 5 he was asked to
Figure 3. Match-to-real-face lesson- James.
identify his instructor’s crying face and was able to do so 10/10 times (100%) over one trial. In step 6 he was asked to make the sad/crying face in the mirror. He was able to do so 9/10 times (90%) on the first trial but did require the assistance of two physical prompts. On the second trial he was able to do so 9/10 (90%) times but did not require any prompting. In step 7 he was asked to identify his instructor’s angry face. He was able to do so 6/10 times (60%) and required one partial physical prompt. On the second trial he was able to correctly identify the angry face 8/10 times (80%). In step 8, James was asked to make the angry face in the mirror. He was able to do so 8/10 times (80%). In step 9 the resource teacher randomly selected and made one of the four emotive faces. He was asked to identify each of the four emotions at random. He was able to do so correctly 100% of the time (10/10). Finally, in step 10 he was asked to imitate each of the four emotions at random. He was able to do so 10/10 times (100%).

Visual inspection of James’s mirror-lesson graph showed an average score of 8.8. The trend of the data had a flat slope with low magnitude. There was a high level of variability of the data.

*Description of Participant-Leanne*

Leanne is a 3-year, 3-month-old female. She has a diagnosis of autism, and her CARS score is in the severe range. English is her first language, and no other language is spoken in the home. She lives with her mother and father who are her biological parents. She is an only child. There are no other co-morbid medical or psychiatric diagnoses. She is nonverbal and relies mainly on gestures to communicate.

Scores on the Assessment of Basic Language and Learning Skills were examined. Results revealed that her top scores were in Motor Imitation (5/5). She also scored
Figure 4. Mirror-lesson- James.
well (4/5) on Cooperation with Adults and on Requests. Scores on Vocal Imitation, Vocal Play, and Receptive revealed lower scores (2/5). Lowest scores (1/5) were on Receptive Language, Labeling, Conversational skills, Social Interaction, and Letters and Numbers.

Scores on the Vineland Adaptive Behaviour Scales revealed the following results: Communication, standard score 64; Daily Living, standard score 71; Socialization, standard score 69; Motor Skills, standard score 117. Taken together these scores provide a composite score of 74.

*Emotions Unit-Leanne*

Leanne did not complete the emotions unit as she left the program for the Autism Initiative before completing the unit. As a result only, information for labeling emotions is available (see Figure 5).

Four different emotions were used: happy, sad, sad/crying, and angry. All four graphic stimuli were presented at once and Leanne was asked to identify each emotion. This was done over 4 days. On day 1, Leanne had the most difficulty. On sad and angry, she scored 10/10 (100%). However, on the happy graphic she scored 9/10 (90%). Leanne had trouble with the sad/cry graphic, scoring just 3/10 (30%). Despite the difficulties experienced on day 1, Leanne scored 10/10 (100%) on all subsequent trials.

*Description of Participant-Joel*

Joel is male, his age and diagnosis are unknown. English is his first language, and no other language is spoken in the home.
Figure 5. Emotion-graphics-lesson- Leanne.
Emotions Unit-Joel

Emotion-graphics lesson.

In step 1 of the matching emotion graphics, Joel was asked to match the happy face graphic. He was able to do so correctly 10/10 times (100%) over the first two trials, however he required two full physical prompts in each trial. On the third trial he was able to correctly match the happy graphic 8/8 times (100%). In step 2 he was asked to match happy with happy in the presence of a distraction, the sad face graphic. He was able to do so correctly 10/10 times (100%) but required one partial physical prompt. On the second trial, however, he was able to do so 10/10 times (100%) without the assistance of a prompt. In step 3, he was asked to match the sad graphic. He was able to do so 10/10 times (100%) on the first and only trial. In step 4, he was asked to match sad and happy simultaneously. He was able to do so 10/10 times (100%) over one trial. In step 5, he was asked to match angry. He was able to do so 8/10 times (80%) but required one full physical prompt. On the second trial of step 5 he was able to do so 8/10 times (80%) without a prompt. In step 6, he was asked to match angry with angry in the presence of a distraction. He was able to do so 10/10 times (100%) on the first trial. In step 7 he was asked to match all emotions at random. He was able to do so 10/10 times (100%) over three trials without the assistance of prompts.

Visual inspection of Joel’s emotion-graphics lesson graph showed an average score of 9.7. The slope of the graph is flat, with a low level of magnitude. There is a low degree of variability in the data.
Figure 6. Emotion-graphics lesson- Joel.
Mirror-lesson.

Details of the lesson followed in steps 1 and 2 are not known. In step 1 of the mirror lesson Joel received 7/10 (70%) but required one partial physical prompt. In step 2 he received 8/10 (80%) and did not require any prompting. In step 3 Joel was asked to make a sad face in the mirror. He was able to do so 10/10 times (100%), and required one partial physical prompt. In step 4, he was asked to make a sad/crying face, and again was able to do so 10/10 times (100%). In step 5 he was asked to make an angry face in the mirror. He had some difficulty with this and was correct 3/10 times (30%). In the second trial of step five he again had a great deal of difficulty and scored incorrectly four consecutive times. At this point, the emotions in the mirror test was discontinued due to the frustration of the child.

Visual inspection of Joel’s mirror lesson revealed an average score of 7. The slope of the graph is negative, with a high level of magnitude. There is a high degree of variability of the data.

Match-to-real-face lesson.

In step 1 of the match-to-real-face lesson, Joel scored 5/10 (50%). In step 2, he was able to respond correctly 10/10 times (100%). Finally, in step 3, he was able to answer correctly 9/10 times (90%).

Visual inspection of the graph revealed a mean score of 8. The trend of the data showed a positive slope with a high level of magnitude. There was medium variability of the data.
Figure 7. Mirror-lesson- Joel.
Figure 8. Match-to-real-face lesson- Joel
Description of Participant-Bradley

Bradley is a 3-year, 5-month-old male with severe autism. English is his first language and no other language is spoken in the home. His expressive language skills are emerging and consist of some words and gestures. He lives with his mother and father who are both his biological parents. He also has one sister who is a normally functioning child. He does not have a co-morbid medical or psychiatric diagnosis and is not taking any medication.

Emotions Unit-Bradley

Emotion-graphics lesson.

For the emotion-graphics lesson, Bradley’s resource teacher started by asking him to match the happy face graphic with another happy face graphic. He was also asked to point to happy. He had no difficulty with this on the first four trials, scoring 10/10 (100%). On the fifth trial, however, he required two gesture prompts. On the sixth and final trial he again scored 10/10 (100%) and did not require any prompts.

Step 2 required Bradley to point to happy in the presence of a distraction, in this case a sad face graphic. On the initial trial of step 2, Bradley required a partial physical prompt, but was able to score 10/10 (100%) on this trial. He also scored 10/10 on all subsequent trials.

Step 3 required him to point to the sad face graphic only. He was able to do so accurately on all three trials and scored 10/10 (100%) on all trials. Step 4 required him to point to sad in the presence of a distraction, in this case the sad face graphic. On the first trial he was able to do so scoring 10/10. On the second trial he had one incorrect and scored 9/10 (90%) but was able to score 10/10 on the subsequent two trials. Step 5
required him to point to angry. He scored 10/10 (100%) on all four trials but did require one full physical prompt and one partial physical prompt on the third trial. In step 6, Bradley’s resource teacher placed the angry and sad face graphics on the table. Bradley was asked to point to angry only. He was able to do this over four trials, and scored 10/10 (100%). In step 7, the happy and angry graphics were placed on the table and Bradley was asked to match the angry graphic only. He was successful in the 10/10 times (100%) over two trials, but did require one full physical prompt on the second trial.

In step 8 the happy, sad, and angry emotions were placed on the table. Bradley was asked to point to these emotions at random. He was able to do so 10/10 times (100%) over three trials. In step 9, he was asked to match the sad/crying graphic to the sad/crying graphic. On the first two trials he was correct 9/10 times (90%), but did require one partial physical prompt. On the subsequent three trials he was able to do so 10/10 times (100%). In step 10 he was asked to point to the sad/crying graphic. On the first trial he gave one incorrect answer 9/10 times (90%), but was able to do so 10/10 times (100%) over the following three trials. In step 11 he was required to point to sad/crying in the presence of two distractions, the happy face graphic, and the sad face graphic. He was able to do so correctly on the first and second trial, however on the second trial he required a partial physical prompt. On the third trial he gave one incorrect answer and scored 9/10 (90%), but scored 10/10 (100%) on the following trial. Step 12 required that Bradley point out each of the four emotions at random. He was able to do so 10/10 times (100%) over one trial, concluding the graphic emotions lesson. Visual inspection of Bradley’s emotion-graphics lesson graph revealed an average score of 9.8.
Figure 9. Emotion-graphics lesson- Bradley.
The slope of the data is flat with a low level of magnitude. The variability of the data is medium.

_Mirror lesson._

Step 1 of the mirror lesson required that Bradley identify his resource teacher’s happy face in the mirror. He was able to do this accurately 10/10 times (100%) over two trials. Step 2 of the lesson required Bradley to make a happy face in the mirror. On the first trial he scored 8/10 (80%). On the second trial he improved his score to 9/10 (90%). In step 3 he was required to identify his resource teacher’s sad face in the mirror. On the first trial he scored 10/10 (100%) but required three partial physical prompts. On the second trial his score declined to 8/10 (80%), however he did not require any prompting. In step 4, Bradley was asked to make a sad face in the mirror. He had a great deal of difficulty with this and despite six full physical prompts, he was not able to make a sad face in the mirror. On the second and third trial he continued to experience difficulty, requiring 5 and 10 full physical prompts respectively; thus the lesson was discontinued.

Visual inspection of Bradley’s mirror-lesson graph showed an average score of 7. The slope of the data is negative with a high level of magnitude. The variability of the data is high.

_Match-to-real-face lesson._

In the match-to-real-face lesson, Bradley’s resource teacher started by asking him to match the happy face graphic with a real photograph of a family member making a happy face. Bradley was able to do so 10/10 times (100%) over two trials. Step 2
Figure 10. Mirror lesson- Bradley.
involved having him match the happy photograph with the happy graphic in the presence of a distraction, the sad face graphic. He was able to do this 10/10 times on the first trial, but made one mistake scoring 9/10 (90%) on the second trial. On the third and fourth trials, however, he again scored 10/10 (100%). In step 3, Bradley was asked to match the sad face graphic with a photograph of a family member making a sad face. He scored 9/10 (90%) on the sole trial. In step 4, Bradley was asked to match the sad face graphic to the sad photograph in the presence of a distraction, the happy face photograph. He was able to do this 10/10 times (100%) over two trials. In step 5, Bradley was asked to match the happy and sad photographs randomly with the happy and sad graphics. Again, he was able to do so 10/10 times (100%) over two trials. In step 6, Bradley began to have some difficulty. He was asked to match the angry graphic with the photograph of a family member making an angry face. On the first trial he scored 6/10 (60%) and required three full physical prompts. On the second trial he improved, somewhat scoring 8/10 (80%) and required two full physical prompts. In step 7, Bradley was asked to match the angry face graphic with the angry face photograph in the presence of a distracter, the sad face graphic. He was able to do so 10/10 times (100%) over two trials. In step 8, he was asked to match the angry, sad, and happy graphics randomly with their graphic counterparts. He was able to do this 10/10 times (100%) over 2 trials. In the 9th and final step he was asked to match the sad/crying graphic to a photograph of a family member making a sad/crying face. He was able to do so 10/10 times (100%) over two trials.

Visual inspection of Bradley’s match-to-real-face lesson graph revealed an average score of 9.4. The slope of the graph is positive with a low level of
Figure 11. Match-to-real-faces lesson- Bradley.
magnitude. There was a medium level of variability in the data.

*Description of Participant-Robert*

Robert is male. English is his first language and no other language is spoken in his home. No other information is known.

*Emotions Unit-Robert*

*Emotion graphics lesson.*

Details of each lesson are not known. A baseline was taken for the matching emotion graphics lesson. He was able to score 10/10 (100%) over two trials and did not require any prompting.

*Match-to-real-face lesson.*

In step 1, Robert scored 6/10 (60%). In step 2 he scored 8/10 (80%). In step 3 he improved to 10/10 (100%) but fell to 9/10 (90%) and 8/10 (80%) on the second and third trials. In steps 4 and 5, however, he was able to respond correctly 10/10 times (100%).

Visual inspection of Robert’s match-to-real-face lesson graph showed an average score of 8.5. The slope of the data is positive with a high level of magnitude. There was a low level of variability of the data.

*Description of Participant-Mark*

Mark is a 5-year, 2-month-old male. He has a diagnosis of autism which has been categorized at the moderate level by the CARS. He speaks both English and French, and both of these languages are spoken in the home. He lives with two parents, who are
Figure 12. Match-to-real-faces lesson- Robert.
remarried. He has three siblings: two sisters and a brother. He does not have any co-morbid medical or psychiatric diagnoses. He does not take medications other than an asthma inhaler. His expressive language skills are emerging and he uses some words and gestures to communicate.

The short form of the Assessment of Basic Language and Learning Skills was administered. His top score was on Cooperation with Adults (5/5). On the Social Imitation subtest he scored 4/5. He scored 3/5 on Match to Sample and Receptive. He scored 2/5 on the Labeling, Conversational Skills, and Social Interaction subtests. His lowest scores were on the Receptive Language and on the Letters and Numbers subtests (1/5). Scores on the Vineland Adaptive Behaviour Scales were as follows: Communication, 54; Daily Living Skills, 57; Socialization, 56; and Motor Skills, 64.

*Emotions Unit-Mark*

*Emotion graphics lesson.*

On the first step of the matching emotions graphics lesson, Mark scored 10/10 (100%) but required two partial physical prompts. On the second trial of step 1 he scored 10/10 (100%) and did not require any prompts. In steps 2 and 3 he was able to score 10/10 (100%). In step 4 he scored 9/10 (90%) and required one partial physical prompt. In step 5 he scored 7/10 (10%) and required two partial physical prompts. On the second trial of step 5 he scored 9/10 (90%). In step 6 he scored 8/10 (80%). On step 7 he scored 10/10 (100%) and on step 8 he scored 9/10 (90%). On step 9 he scored 8/10 (80%) on the first trial, and 9/10 (90%) on the second.
Visual inspection of Mark’s emotion graphics lesson graph revealed an average score of 9. The slope of the data is negative with a low level of magnitude. There is a medium level of variability of the data.

*Mirror lesson.*

In step 1 of the emotions in the mirror lesson, Mark scored 10/10 (100%) but required the assistance of three partial physical prompts. On the second trial of step 1 he was able to score 10/10 (100%) without the assistance of a prompt. In step 2 he scored 6/10 (60%) on the first trial with assistance of two partial physical prompts. On the second trial of step 2 he scored 10/10 (100%) with the assistance of one partial physical prompt. In steps 3, 4, and 5 he scored 10/10 (100%). In step 6 he scored 9/10 (90%) and had the assistance of one partial physical prompt. In steps 7 through 10 he scored 10/10 (100%).

Visual inspection of Mark’s mirror-lesson graph revealed an average score of 9.5. The slope is flat, with a low level of magnitude and moderate level of variability.

**Visual Inspection of Graphs**

Results of the visual inspection of the graphs were compiled in chart form for ease of comparison. Frequency counts and an overall mean were also calculated. Results revealed that of the 13 lessons analyzed, only 2 did not meet criteria (i.e. the participant scored <8/10). The slope of the data showed that the majority were flat (6/13), with positive slope next (4/13). Only three (3/13) of the children’s data had a negative slope. Two of these negative slopes in the data were on the mirror lesson and also did not meet criteria, the third negative slope was on the graphics lesson. All four of the positive slopes were on the match-to-real-faces lesson.
Figure 13. Emotion-graphics lesson- Mark.
Figure 14. Mirror-lesson- Mark.
Table 2

Results of Visual Inspection of Graphs

<table>
<thead>
<tr>
<th>Name</th>
<th>Figure</th>
<th>Lesson</th>
<th>Number of steps</th>
<th>Mean</th>
<th>Slope</th>
<th>Magnitude</th>
<th>Variability</th>
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<td>1</td>
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<td>flat</td>
<td>low</td>
<td>low</td>
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<tr>
<td></td>
<td>2</td>
<td>mirror</td>
<td>10</td>
<td>9.1</td>
<td>flat</td>
<td>low</td>
<td>medium</td>
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<tr>
<td>James</td>
<td>3</td>
<td>real pictures</td>
<td>3</td>
<td>8</td>
<td>positive</td>
<td>high</td>
<td>medium</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>mirror</td>
<td>10</td>
<td>8.8</td>
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<tr>
<td>Joel</td>
<td>6</td>
<td>graphics</td>
<td>7</td>
<td>9.7</td>
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<tr>
<td></td>
<td>7</td>
<td>mirror</td>
<td>5</td>
<td>7</td>
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</tr>
<tr>
<td></td>
<td>8</td>
<td>real pictures</td>
<td>3</td>
<td>8</td>
<td>positive</td>
<td>high</td>
<td>medium</td>
</tr>
<tr>
<td>Bradley</td>
<td>9</td>
<td>graphics</td>
<td>12</td>
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<td>flat</td>
<td>low</td>
<td>medium</td>
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<tr>
<td></td>
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<td>mirror</td>
<td>4</td>
<td>7</td>
<td>negative</td>
<td>high</td>
<td>high</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>real pictures</td>
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<td>9.4</td>
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<td>low</td>
<td>medium</td>
</tr>
<tr>
<td>Robert</td>
<td>12</td>
<td>real pictures</td>
<td>4</td>
<td>8.5</td>
<td>positive</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>graphics</td>
<td>9</td>
<td>9</td>
<td>negative</td>
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<td>low</td>
<td>medium</td>
</tr>
</tbody>
</table>
Content Analysis-Parent Interview

Mary is the mother of Bryan, a 4-year-old child who has been diagnosed with mild to moderate autism. To maintain the confidentiality of the child, it was not possible to match the data from the emotions unit with the interview. Mary was interviewed using an interview script modeled after Denham’s (1998) emotional competence interview script. The parent interview transcript was analyzed for the following three themes: expression of emotion, understanding emotion, and emotion regulation.

Expression of Emotion

Mary explained that Bryan revealed the ability to express his emotions. At times he had difficulty conveying his feelings; however, with the use of picture symbols (pics) and sign language his communication was facilitated. He was also able to make some jibberish sounds such as *ma*, *pa*, *ba*, and *da*; as well as to mimic sounds that his mother made. Some emotions were easier for Bryan to express than others, however Mary described the variety of ways in which he was able to convey his emotions. In general, Mary described Bryan as a happy, affectionate, and loving child who smiles and laughs a lot. For example, she said, “He loves to give hugs and will come up and give me a hug on his own. He is very snuggly.” She stated that when Bryan becomes angry he tends to lay down on the floor and cry. She also said that he stomps his feet and may pull his sister’s hair or scratch her when they fight. She did note that his anger has been reduced lately, stating “[he] has had a lot less aggression recently.” She reported that he is a social child who loves to play with his family. For example, she said,

At home he is a very social child who wants to interact, wanting to continually play with his family. The school he attends tell me that he engages in parallel
playing and turn taking with other kids. ...He will play with other kids in the playground; for example, he will allow another child to share his truck toys with him.

In terms of complex emotions, Mary noted that she has observed jealous emotions in Bryan. She stated that occasionally when his older sister Alana is sitting on her lap, he tends to pull her off, which suggested to her that he is jealous. She stated that he has also shown signs of embarrassment to Mary.

*Emotion Understanding*

According to Mary, Bryan was not able to use a vocabulary of emotions to indicate his feelings. However, Mary noted that he has imitated her signs for happy and sad. According to Mary, he generally does not sign his emotions, although she said that sometimes if she is singing a song with the word happy in it, he will make the sign for happy. She also said that she has taught him to say sorry when he does something wrong, but added that she does not think he really understands what it means to be sorry. She said that when she praises him he has a strong reaction, and has a big smile on his face.

Mary described that Bryan recognizes happy and angry emotions in others. At one time he appeared to recognize her emotions and she understood this to represent empathy. She said,

There was one time recently where I fell down and hurt my ankle. Bryan seemed to know that I was hurt and he started to cry. When I cry he cries. He wanted to sit on my lap. A few days later I had my leg up with an icepack on it, and he didn’t like it and wanted to take the icepack off and put my foot on the floor. It was as though he didn’t want me to be hurt.
Regulation of Emotion

According to Mary, a main challenge with Bryan was his sensitivity to certain sounds such as the radio, or echoing in the school gym. In particular she stated that he was upset by the sound of babies crying. When he has been exposed to this sound, his reactions have been volatile. She stated,

If I’m not careful he can be aggressive with other children who are crying... if Alana was hurt and crying he would go after her and can be aggressive. I think he just wants her to stop crying because it bugs his ears.

Mary noted that Bryan copes with distressing emotions, such as fear, by being picked up. She stated that if he becomes fearful—for example, by a big dog in the park—he runs to her and wants to be picked up. She reported that if he hears a sound he does not like, such as the vacuum cleaner, he tends to remove himself from the room. When he is angry he lies down on the ground and cries. She indicated that he copes with pleasurable emotions by laughing a lot, particularly following physical play.
CHAPTER FIVE: DISCUSSION

Explorative studies on emotional education for children with ASD have been sparse in the past. Little is known as to the effectiveness of the programs; moreover, previous evaluative studies on emotion programs for children with ASD have failed to address their difficulty in generalizing what they have learned in other contexts. The development of focal session programming aimed to overcome this using several strategies including the use of different materials, cues, and people both within and outside the instruction session. Generalization was also encouraged within the home environment through teacher communication with parents. Previous research (Swettenham et al., 1996; Wellman et al., 2002) has suggested that programs designed to improve emotion understanding in children with ASD may be more effective when part of the children’s regular curriculum, as they would receive instruction for a longer period of time. The program studied here did just that—taught emotions to children in inclusive educational settings.

This chapter provides an overview of the present study’s key findings. These findings are discussed in terms of previous research, although it is important to remember that due to the exploratory and descriptive nature of this study no causal claims can be made. Implications for future research and clinical practice are discussed.

Summary of the study

The questions central to the present multiple case study were: 1) Will targeted direct instruction help preschoolers with ASD learn to recognize and discriminate four basic emotions in others and self as indicated by data on trials to criteria? and 2) Will
parents of the children receiving this intervention observe events of emotion recognition in the home environment with family members?

Secondary analysis of children's total scores per trial on the emotion program were graphed and analyzed using methods of descriptive statistics. A parent interview was completed to assess the parent's perceptions of the emotions unit.

The emotion score totals per trial were entered into a data processing program. These data were then used to generate discrete graphs for each child. Visual inspection of graphs, a practice well grounded in behavioural research, was used to analyze the data (Kennedy, 2005). Field notes were taken during the parent interview, and later transcribed by the researcher. The transcript was sent to the parent for a member check, and was edited accordingly. A content analysis (Creswell, 2002) was then performed on the transcript to explore the themes of understanding of emotion, expression of emotion, and regulation of emotion; which constitute Denham's (1998) correlates of emotional competence.

Summary of Results

*Within-Case Analysis*

On the emotion-graphics lesson, most children had a great deal of consistency amongst them. The overall mean of the lessons was 8.75, with only 2 children not meeting criteria on one of the lessons.

Children had the most success of the three lessons on the real pictures lesson, however some participants had difficulty with step 6 which required them to label a sad/crying face of a family member. The mirror lesson presented the most challenge to the children and account for the 2 children that did not meet criteria. These children both
had difficulty with step 3 which required them to express anger in the mirror. Unfortunately the lesson had to be discontinued due to the participants’ frustration, but despite their difficulty with the mirror lesson, they were both able to pass the graphics lesson. Two other participants also had difficulty with this task, particularly expressing a happy emotion in the mirror, but were able to complete the other steps in the lesson and meet criteria.

**Parent Interview**

Content analysis of the parent interview revealed that Bryan expressed positive affect, such as happiness. Although he was mostly nonverbal, he was able to express his emotions by smiling and laughing, giving hugs, crying, and stomping his feet. His mother felt that he showed signs of understanding praise, by getting a big smile on his face. She also felt that he demonstrated an ability to empathize after she hurt her ankle, and he became upset by seeing her in pain. According to Bryan’s mother, Bryan showed the most difficulty with regulation of emotion, as he had particular trouble with loud noises. At times he could become aggressive if another child was crying, or if the vacuum cleaner was running, which created a lot of fear in his mother as she worried he may hurt another child unintentionally. Overall, Bryan’s mother noticed large gains in her son’s ability to understand and express his emotions, and described it as though “he has woken up from a sleep.”

**Discussion**

Overall, results of the study showed that the emotions program was successful, in that all 7 participants successfully met criteria on the emotions tasks. That is, test scores revealed that most children showed signs of emotion recognition by the end of the
program (matching emotion graphics, matching photographs of real people demonstrating emotions, and expressing emotions in a mirror). In addition to test scores, one parent’s account indicated that she perceived her child benefited greatly from the program. Specifically, the parent noted that her child had an increased ability to express his emotions and recognize four basic emotions of his family members, although he continued to have difficulty with regulating his emotions under stressful situations.

It is important to note that emotion recognition is only one aspect of emotional competence which is a multi-faceted developmental process (Harris, 2001). It would be difficult to determine the specific influence of the emotion program on the participants’ emotional understanding alone; however, in this relatively small sample, it appeared to be quite effective. Given the lack of research on programs that promote emotional understanding in children with ASD, this study was unique in that it described young children’s ability to learn about emotion recognition within the context of an intervention program. Typically developing children are known to develop a level of theory of mind including a level of emotion understanding between 3 and 4 years of age (Astington, Harris, & Olson, 1988; Denham, 1998). This study looked at the ability of children between the ages of 3 and 5 years of age to learn the ability to identify, label, and discriminate four basic emotions. Swettenham et al. (1996) pointed to the possibility that focusing on children’s ability to attend to lessons may be an important factor in their ability to master more complex information, such as theory of mind tasks. The emotions program investigated in the present study, required children to first pass educational set behaviour, which required them to attend to the lesson at hand, as a prerequisite prior to starting the emotions lessons (Rahn, Malatest, & Albanese, 2003). This may provide one
explanation as to why children of such a young age were able to pass the emotion recognition tasks. This may also coincide with the fact that the program was taught as part of the children’s regular school curriculum. It is possible that the consistency and continuity of learning from the same resource teacher and in the same environment, allowed by incorporating such a program into the curriculum, provided the impetus for the success of the program.

The findings of this study were in line with Stafford (2000), who attempted to teach emotions to a low functioning 9-year-old autistic boy. Stafford (2000) found that by teaching emotions gradually and intensively, the participant was able to correctly label emotions and also to generalize what he learned to photographs he had not seen before. The success of the emotions program was attributed to the duration of the program, and also by minimizing failure through simplifying requests and building on them. The emotions program utilized in the present study was also founded on a similar concept-tailoring the program to the child’s level and introducing concepts slowly over a longer duration.

The true test of the emotions program was whether the children were able to carry forward what they learned in these programs to other contexts, such as at home. Previous studies showed that children who were taught concepts such as theory of mind and emotion understanding had difficulty generalizing what they learned (Hadwin, et al., 1996). Studies that provided children with an alternative strategy for applying these tasks were the most successful; overall, however generalization appeared to be an area of great difficulty for children with ASD (Swettenham, et al., 1996; Wellman et al., 2002). To address the difficulty that children with ASD have in generalizing emotion concepts to
contexts other than those in which they were taught, the program studied utilized a structured generalization approach (Rahn, Malatest, & Albanese 2003). The parent interviewed in this study reported that she noticed large gains in her son after his participation in the program. Given that successful generalization of emotion concepts across multiple contexts has been sparse, this was one of the most inspiring aspects of the research. The fact that the child’s interaction with his family improved greatly provides support for such programs, and also points to the importance of interviewing family members as to their perceptions of the impact of emotion programming. It is important to point out however that these results should be interpreted with caution due to the small sample size. Future research should consider interviewing family members to provide valuable insight into the impact of emotion programs on the child’s functioning at home. It would also be interesting to observe the child’s interactions with her/his family at home.

One specified area of need created by the parent interview, and also by the results from the emotion unit scores, concerns emotion regulation. The mirror unit appeared to provide the greatest amount of difficulty for the participants. This task involved the children mimicking emotional expressions in a mirror, a task that required the children to express their own emotions, but also to regulate their emotions. They appeared to have particular difficulty with the negative emotions of anger and sad/crying. The parent who was interviewed pointed to her son’s difficulty with regulating his emotion when loud noises were present. This may indicate the need to develop this section of the program. Perhaps a slow introduction to the mirror unit would reduce the child’s anxiety and improve the outcome. For example, one could start by having the child become
comfortable with the mirror, holding it, playing with it, and so on, before introducing the notion of expressing emotions in the mirror.

Implications for future research

This study aimed to provide a realistic look at an educational intervention currently used to assist young children with ASD to identify, label, and discriminate four basic emotions in self and others.

It would be interesting to replicate this study, using a larger sample. Ideally, the emotions program should be evaluated using a pre-test, post-test design to empirically analyze the effects of the program and to follow the sample longitudinally over a period of years. The educational intervention was intended to teach children with ASD to identify, label, and discriminate four basic emotions in self and others. This is significant in light of previous research which suggests that children with ASD may not attend to faces or key facial features (Ballie, 2001; Kropp, 2002). Providing an intervention such as the one studied here to teach relevant facial patterns and to label and use these patterns with social partners may provide the important next steps in emotional development. It would be interesting to determine the effects of the emotional intervention in the participant’s emotional development over time.

It would also be worthwhile to extend the qualitative aspect of this study to include more participants. The information obtained from Bryan’s mother provided a great deal of insight into how the program affected her son, and it would be interesting to compare her experience with other caregivers and perhaps siblings as well. It may also prove beneficial to compare the caregiver’s interview with the child’s actual performance on the emotions unit in order to minimize the effects of social desirability.
One of the questions to raised by this study is how the children who received the emotions program will cope with the “real world” in the future. Lovaas and Smith (2003) point to the importance of early intervention for children with ASD. This program allowed children to benefit from emotion intervention at a young age and as a part of their regular school curriculum. A follow-up study would highlight whether the emotions program had an impact on the children’s functioning as they grew up. It would also enable researchers to determine whether children’s increased ability toward the emotions understanding lead to an improved ability to pass theory of mind tasks. Future research should focus on sociocultural influence on emotion understanding such as gender, social class, and ethnicity.

Several studies describe that emotion programs including computer interventions may be appropriate for children with ASD as they may find it less stressful to communicate with the computer versus other people (Swettenham, 1996). It may be useful to incorporate computerized versions of the emotions tasks into the current program. Swettenham (1996) suggests that computers are thought to be particularly useful for children with ASD because they do not involve social factors, are consistent and predictable, and allow the child to take active control of the task at her or his own pace. Other studies have pointed to the efficacy of peer support for children with ASD (Kamps et al., 2002). It has been shown to improve social interaction, and also generalization, when non-disabled peers are involved in the program.

Final Thoughts

ASD research has grown extensively in recent years; however, it continues to be a complex puzzle which requires further investigation. Emotion understanding children
with ASD is even less understood, although programs such as the one explored in the present study are helping to slowly put the pieces of the puzzle together. Overall, this study suggests that there may be benefits to providing instruction as part of a regular curriculum over an extended duration, as opposed to a discrete period of time in a laboratory setting, although more research in this area is required. The benefits of tailoring instruction to each individual child are difficult to assess, but appear to be important for minimizing failure and maximizing success as no two children are completely alike. One of the most interesting and novel aspects of this research is the inclusion of the parental interview. Past research has suggested that generalization of emotion concepts following emotional intervention is problematic (Hadwin et al., 1996). In this study, the parental interview showed that, the parent perceived that the emotion’s unit had a positive influence on the participant; although this result must be interpreted with caution due to the small sample size. While more research in this area is needed to expand on these findings, this study provided support for the explored emotion intervention (Rahn, Malatest, & Albanese, 2002).
References


The Brock University Research Ethics Board has reviewed the above research proposal.

**DECISION:** Accepted as clarified.

This project has been approved for the period of June 5, 2003 to October 31, 2003 subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The approval may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and approved by the REB. The Board must approve any modifications before they can be implemented. If you wish to modify your research project, please refer to www.BrockU.CA/researchservices/forms.html to complete the appropriate form REB-03 (2001) *Request for Clearance of a Revision or Modification to an Ongoing Application.*

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects, with the exception of undergraduate projects, upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form *REB-02 (2001) Continuing Review/Final Report* is required.
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Please quote your REB file number on all future correspondence.
Deborah Van Oosten
Research Ethics Officer
Brock University  http://www.brocku.ca/researchservices/
phone: (905)688-5550, ext. 3035   fax: (905)688-0748
Appendix B

Host Health Institutions Research Ethics Board Approval

June 18, 2003

Ms. Amanda Varnish
39 Queen Street
St. Catharines, ON L2M 2B7

Re: Evaluation of an emotion program in preschoolers with autism spectrum disorders

Dear Amanda:

Thank you for your presentation to the Research Ethics Board of Hotel Dieu Health Sciences Hospital, Niagara on Thursday, June 12, 2003. We are pleased to inform you that your research proposal, to be carried out in conjunction with Child and Adolescent Developmental Services of Hotel Dieu, has been approved.

We wish you well in your research and would look forward to hearing from you upon completion of your study.

Yours truly

Dr. J. Luce
Chair
Research Ethics Board

Cc: Ms. A. Atkinson
Appendix C
Emotions Unit

Focal Session Programming

Lesson Unit: EMOTION

Prerequisite Learning:
- Educational Set Behaviour Unit;
- Response repertoire: Give Me; Touch the... Point to; Put on.; Put in; Take out.
- Experience with complex discrimination e.g. selection of target response in presence of at least 3 other learned stimuli e.g. Shape, Object Identification.

General Objectives Of This Instructional Unit

Individual lesson plans within this unit have been developed to assist the young child with Autism Spectrum Disorder to learn basic emotions with respect to a) Identifying graphic representations of them; b) Associating the emotions with real faces including self and other; c) cognitively use and adapt a) and b) across people and locations.

NB. If the child is verbal or has the potential for learning the verbal label (according to the Speech Pathologist) an attempt to elicit the verbal label for each emotion will be attempted. If the child is non verbal, the verbal labels will be used and taught to the child with response contingent upon receptive language comprehension. In our clinical experience to date every child has had some level of receptive language comprehension with which to work.

1) Simple Face Graphics Paired With Verbal Labels: Using Direct Instruction assist the child to learn the following graphic faces emphasizing key features e.g. curve of mouth, eyes/eyebrows. Each is taught as a separate lesson to criteria (with a distractor). As each is learned to criteria, it is added to the discrimination task of the next.
NB. Emotions taught are based on literature review and clinical experience of *most frequently used* emotions according to parental requests to teach emotions related to daily events.

![Emotions](image)

**Happy**  **Sad**  **Angry**  **Sad/Crying**

- **Structured Generalization** consists of using learned graphic faces with the child using 3 levels of generalization as specified in the Focal Session Lesson plans (Section of lesson plan attached).

2) **Pair Face Graphics With Real Photographs of the Emotions**: Using Direct Instruction assist the child to learn the association of the graphics to real photographs of those emotions. Each emotional association is taught to criteria for each emotion, individually, before lessons in which a graphic face is selected (discriminated from the rest) and matched with the correct photograph.

- **Structured Generalization** consists of using photos of the child's family, e.g. Mother, Father, and Siblings etc. to match graphs of the learned emotions using 3 levels of generalization as specified in the Focal Session Lesson plans (Section of lesson plan attached).

3) **Pair Face Graphics With Child/Instructor Face Using Mirror**: Using Direct Instruction assist the child to learn the association of the graphics and his/her own face and that of the Instructor by using the Emotion-Graphic cards to Take Turns playing "The Face Game"—making the face represented on the card selected in the mirror.

- **Structured generalization** incorporating various social partners in "The face Game" is accomplished by using 3 levels of generalization as specified in the Focal Session Lesson plans (Section of lesson plan attached).
FOCAL SESSION PROGRAMMING

Domain: Pre-Academic  Program: Matching Emotions  Graphics

Date Introduced: Date Mastered: Date Terminated:

Child: Resource Teacher:

1:1 Instructor Child Care Centre:

Prerequisite: Educational Set Behaviour

OBJECTIVE: Child will be able to match line drawn pictures of emotions (happy, sad, angry, sad-crying)

Set Up: at table with instructor

Materials: line drawn pictures of faces portraying the emotions (happy, sad, angry, sad-crying)

#Trials/Block 10

PROGRAM PROCEEDURES:

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
<th>Prompting Conditions</th>
<th>Target Response</th>
<th>Reinforce</th>
<th>Move to Next Step When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Show child a large picture of happy and say “this is happy”, then put it on the table. Present another similar picture and say “This is happy, Put happy with Happy.”</td>
<td></td>
<td>Child will match the targeted emotion</td>
<td></td>
<td>Child has matched the emotion 8/10 times.</td>
</tr>
<tr>
<td>2</td>
<td>Have large picture of happy and sad on the table. Instructor will hand the child a picture of a happy face and say “This is happy, Put happy on happy.”</td>
<td></td>
<td>Child will match the targeted emotion</td>
<td></td>
<td>Child has matched the emotion 8/10 times</td>
</tr>
<tr>
<td>3</td>
<td>Show child a large picture of sad and say “this is sad”, then put it on the table. Instructor will hand the child a picture of sad and say “This is sad, put sad on sad”</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
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<tr>
<td>4</td>
<td>Have large picture of happy and sad on the table. Instructor will hand the child a picture of sad and say, “this is sad, put sad on sad”</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Have large picture of happy and sad on the table. Instructor will hand the child a picture of happy or sad, and say, “this is_____ put ______ on _______” Present pictures in random order.</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Show the child a large picture of angry and say “this is angry”, then put picture on the table. Instructor will hand the child a similar picture and say “this is angry, put angry on angry”</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Have large picture of angry and either happy or sad on the table. Instructor will hand the child a picture of angry and say, “this is angry, put angry on angry”</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Have large picture of happy, sad and angry on the table. Instructor will hand the child one of the emotion pictures and say, “put _____ on _______. “ Present pictures in random order</td>
<td>Child will match the targeted emotion</td>
<td>Child has matched the emotion 8/10 times.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### PROMPTING PROCEDURES:

Full Physical (FP), Partial Physical (PP), Gestural (G), Positional (P), Visual (V), Visual/within stimulus (Vis/ws), Verbal (Vb), Verbal/within stimulus (VB/ws)

<table>
<thead>
<tr>
<th>Most</th>
<th>Partial</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full physical- 1:1 worker will use hand over hand assistance with the child to match the requested emotion.</td>
<td>Partial physical- 1:1 worker will lead child at elbow to match the requested emotion.</td>
<td>Gestural- 1:1 worker will point to the requested picture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positional- 1:1 worker will put the requested picture closer to the child.</td>
</tr>
</tbody>
</table>
REINFORCEMENT PROCEDURES:

<table>
<thead>
<tr>
<th>Verbal cue</th>
<th>Verbal Cue with Gesture</th>
<th>Tangible Edible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CORRECTION PROCEDURES:

**Error Interruption**
If Child starts to make an incorrect response you interrupt, the response with the prompt level needed to ensure a correct response. As you interrupt child’s response you say “this is ______”. **Readminister at a higher level of prompting** - when child makes an incorrect response and you don’t interrupt in time. Do not say anything and readminister the instruction and give a higher level of prompt immediately.

**No Response** – when the child does not respond after 5 seconds then prompt at the level needed for child to respond correctly. If 3 consecutive errors, then increase power of reinforcer.

GENERALIZATION

<table>
<thead>
<tr>
<th>Order</th>
<th>Instruction/SD</th>
<th>Materials</th>
<th>Setting</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Objective: child will correctly match the emotion (happy, sad, angry, sad-crying) when asked by the instructor.</td>
<td>Puzzles Books Etc.</td>
<td>Table and chairs Carpet Circle area Playground Etc.</td>
<td>Teachers Assistants Supervisors Peers</td>
</tr>
</tbody>
</table>
Appendix D

Interview Script

Thank you very much for agreeing to participate in this short interview. The interview will take approximately 30 minutes and will be audio taped, however should you prefer it not to be audio taped, please inform me. Your participation in this study is completely voluntary, and you may end the interview at any time. I will be transcribing the interview, and you will be asked to review the transcript to ensure that it is accurate. The interview transcripts will only be viewed by myself and my supervisor, and your name or your child’s name will be not be associated with your answers. The questions will focus on your child’s emotional understanding. Since parents are often the best experts on their children, the information you are providing is invaluable. This will give me an opportunity to see how they have used what they have learned in pre-school. Please feel free to ask questions at any time. Before we begin do you have any questions?

**turn on tape recorder

The date is XXXX and I am talking with (parent’s name) the mother/father/caregiver for (child’s name). I’d like to ask you a few questions about your child’s emotional competence. I am interested in finding out whether the emotions unit your child participated in has impacted them at home. Are you ready to begin?

1. Tell me a little bit about the members of your family? (i.e. How many people live in your house, if there are other children what are their ages, do they have special needs, are there extended family members, etc.)
2. How do you define emotional competence?
3. How do you know when your child has learned something, or is making progress?
4. Does your child use non-verbal gestures to express their emotions (for example giving a hug)? What kind of gestures?
5. Does your child show empathy to others? For example, would they give a sibling a kiss if he or she fell down?
6. Have you noticed your child showing complex emotions like jealousy, pride, shame or guilt? How so? In what context?
7. Does your child understand other people’s emotional states? For example, do they realize that when Mom comes home smiling, she is happy? Have you seen any examples of this?
8. Does your child use a vocabulary of emotions? For example, do they use words such as happy, or sad to express how they or someone else is feeling? If so, what words do they use and in what context?
9. How does your child cope with distressing emotions?
10. How does your child cope with pleasurable emotions?
11. Have you noticed any other changes in your child since he or she was enrolled in the emotions unit at preschool?
Appendix E

Participant Debriefing

Dear Parent/Guardian,

Thank you kindly for participating in my research study that took place in your child’s pre-school during the winter months of 2004. I am very grateful that you became involved with the research project. Your cooperation, was the key factor that enabled this study to take place.

The goal of this study was to evaluate the effectiveness of the emotions unit at your child’s preschool. It is my hope that the results from this study may provide educators, researchers, and clinicians with insight into the emotional development of preschoolers with Autism spectrum disorders. The current project may lead to the development of future programming.

Enclosed is a summary of the results. To ensure anonymity of participants and confidentiality of data, individual results are not available, and your name, your child’s name, or the name of your child’s school and associated individuals will not appear on any of the data or future materials based on this study.

Data analysis is ongoing and future data dissemination may include 1) presentations at psycho-educational conferences, and 2) published articles in academic education and psychology journals. This thesis is a requirement of my Master of Education degree, and will be stored at the Instructional Resource Centre in the Faculty of Education at Brock University. If you have any questions regarding the research, or would like a copy of future conference and/or journal papers please contact Amanda Varnish c/o Dr. Sandra Bosacki, Faculty of Education, Brock University (Phone number-905-688-5550 ext. 4987), or via e-mail at amandavarnish@hotmail.com.

Again, thank you very much for your time and support. Best wishes to your family for the remainder of the school year!

Sincerely,

Amanda Varnish, B.A. Hons.
M.Ed. Candidate
Brock University