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ABSTRACT

ELICITING FACIAL EXPRESSIONS IN CHILDREN
WITH AND WITHOUT DOWN SYNDROME

by

Orietta Coz

Chair: Rudolph Bailey

ABSTRACT OF GRADUATE STUDENT RESEARCH

Thesis

Andrews University

School of Education

Title: ELICITING FACIAL EXPRESSIONS IN CHILDREN WITH AND WITHOUT
DOWN SYNDROME

Name of researcher: Orietta Coz

Name and degree of faculty chair: Rudolph Bailey, Ph.D.

Date completed: July 2006

This study investigated facial expressions of children between the ages of 10 and 15 years with Down Syndrome (experimental group) and compared them to typically developing children (control group). Elicitation of facial expressions was carried out through showings of video clips. Trained observers were used to code expressions of happiness, anger, and disgust from video recordings that were made of the children's reactions while they watched the video clips.

I hypothesized that Down Syndrome children will not differ from typically developing children in the frequency of elicited happy expressions. However, I expected them to differ in the frequency of elicited anger and disgust expressions.

Results support my hypotheses, showing a significant difference between the control and experimental group when comparing frequency of anger and disgust expressions, but did not differ significantly when the groups were compared in their frequency of happy expressions.

Andrews University

School of Education

ELICITING FACIAL EXPRESSIONS IN CHILDREN
WITH AND WITHOUT DOWN SYNDROME

A Thesis

Presented in Partial Fulfillment

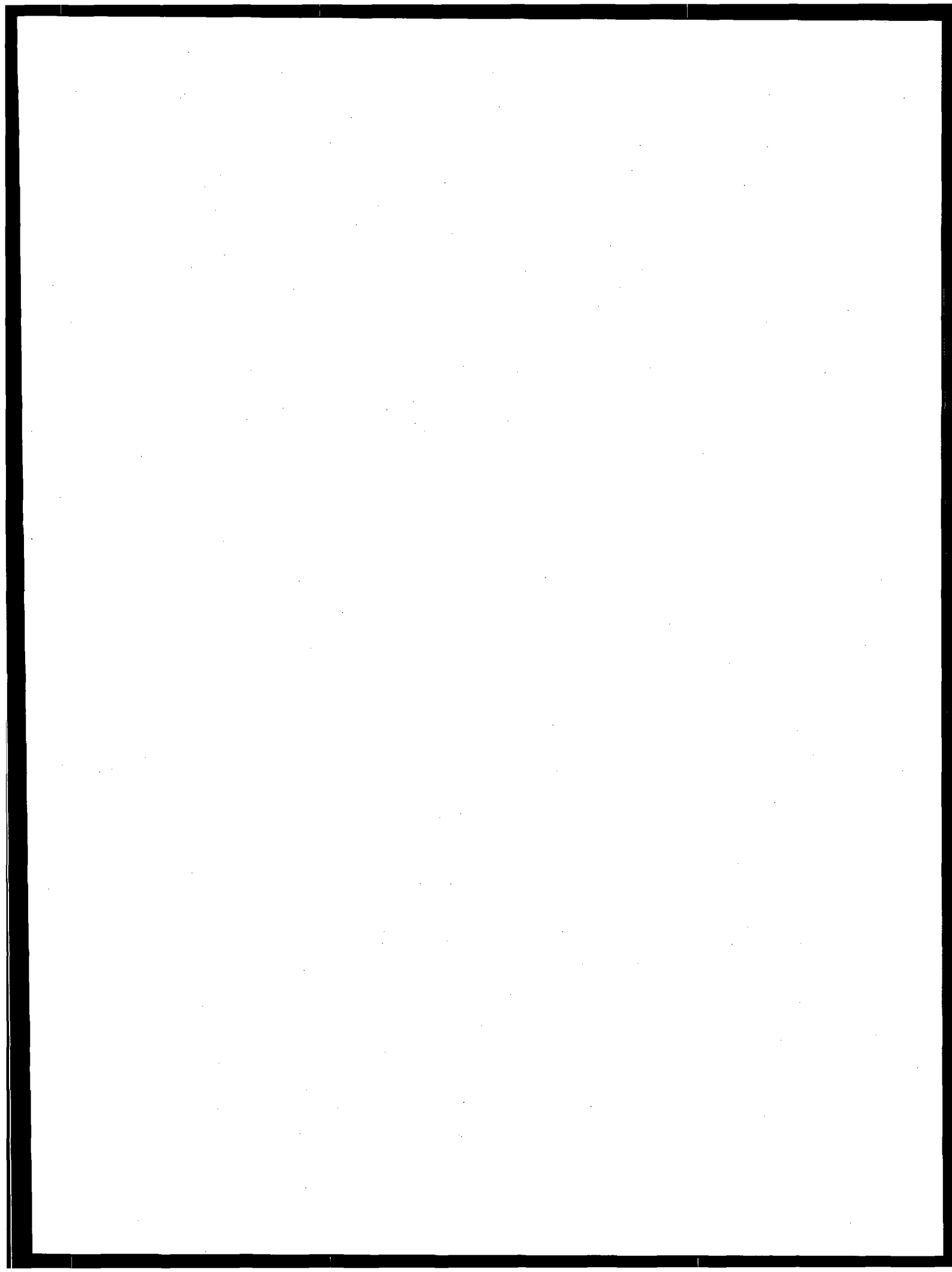
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Master of Arts

by

Orietta Coz

2006



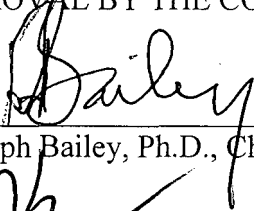
ELICITING FACIAL EXPRESSIONS IN CHILDREN
WITH AND WITHOUT DOWN SYNDROME

A thesis
presented in partial fulfillment
of the requirements for the degree
Master of Arts

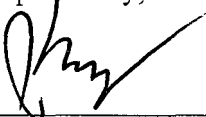
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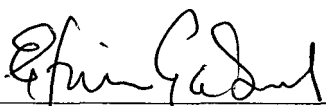
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CHAPTER 1

INTRODUCTION

Rationale of Study

A lack of understanding and response to children with special needs is a concern because there are many differences between children with special needs and typically developing children. One identifying area is in emotional expression and response. Two ways in which individuals are able to express themselves and respond to others is through verbal communication and non-verbal communication. Those individuals with special needs who are not able to express themselves through verbal communication rely on their non-verbal interactions, thus understanding facial expressions is profoundly important to those who work with individuals with special needs.

Facial expressions have long been recognized to be important. Darwin researched facial expressions and their cross-cultural values. He claimed that human expressions and the abilities we possess to recognize them are inherited or instinctive (Fullagar, 2003). If our abilities to recognize other people's facial expressions were hindered, how would we ever know what they were feeling if they could not convey their feelings through vocal expression, and would our response be appropriate? Stereotyping of Down Syndrome children purports that they tend to be happier individuals, due to their remarkably broad smiles (Smith & Dodson, 1996). If you speak to parents of Down

Syndrome children, they will tell you that they have a full range of facial expressions that augments their ability to communicate; however, their expressions differ from typically developed children, and must be learned by others (Maurer & Newbrough, 1987).

In the first few months, the development of children with DS parallels that of children who are developing typically (Hetherington & Parke, 2003). Kasari, Mundy, Yirmiya, and Sigman (1990) found supporting evidence that young infants develop at a typical pace: "Eighteen-to 48-month-old children with DS did not differ from non-retarded children in their frequency of full smiles or laughs, although they displayed a higher frequency of 'slight' smiles without cheek raises" (p. 60). A cross-sectional study conducted by Reddy, Williams, and Vaughn (2002) examined laughter in children with Down Syndrome and Autism. Parent reports did not show a significant difference between the two groups in frequency of laughter or in comparing laughter to visual actions. However, differences were found when laughter was expressed after seeing socially improper acts. Emde, Kligman, Reich, and Wade (1978) depict findings of smiles of infants with Down Syndrome as "disappointing, being characterized by dampened intensity and poor eye contact, with no participation of the cheeks or eyes and lacking 'crescendoing activation'" (Smith & Dodson, 1996, p. 602). Once more, distinct results are discovered. Carvajal and Iglesias (2000) find similarities between the typically developing infants and infants with DS when investigating looking behavior and smiling. Joseph and Tager-Flusberg (1997) conducted a study with samples of children who were Autistic and DS. It was found that "children with Autism spent a significantly smaller proportion of interaction time in positive affect than did the DS children" (p. 391). Children with Autism were also found to exhibit neutral/interested affect more

often, but both groups displayed a small amount of mixed/ambiguous affect and negative affect. This study found similar results to that of Reddy et al. (2002), where similarities between infants with DS and infants with Autism were uncovered. In this study, infants with Autism spent less time exhibiting positive affect in comparison to infants with DS.

We can conclude from infant studies where emotional expression was observed, that children with DS do not function in identical ways to those of typically developing children, yet they also do not function just like children with Autism. However, it seems that “emotional development does appear to be adaptive and organized, similar to the case of typically developing infants” (Carvajal & Iglesias, 2002, p. 105). Keeping this in mind, we must recognize that as children with Down Syndrome develop, the gap increases between them and typically developing children. It is possible that during infancy, children with DS are closer to typically developing children than Autistic children, but a shift takes place as the children with DS get older.

Unlike the previous study, Cicchetti and Sroufe (1978) conducted a study that found “positive and negative affective expressions were diminished in 4- to 16-month-old DS infants, including a reduction in laughing and crying” (Smith & Dodson, 1996, p. 602). This study was an emotional response study, which caused infants to react to a visual loom and a visual cliff in order to observe their facial expressions. The results suggest that even though the facial expressions were created through a different elicitation tactic, the findings are that infants with DS had a different emotional reaction than did typically developing infants, which is also something that Kasari et al. (1990) found in their investigation.

Similarly to the previous study, this investigation elicited facial expressions by bringing forth expressions by producing an emotional reaction to what was being presented. The difference in this study was that the participants were adults. Very little research has been conducted with participants in the age range between adulthood and preschool age. Thus, it is a large leap to apply this information to the adult years. It is presumed that during the preschool years, children have not yet developed emotionally. Then by the time participants are adults they should have reached full emotional maturity. Smith and Dodson (1996) found that during an emotional response task, adults with DS exhibited similar facial expressions when responding to happy stimuli in comparison to the control group (typically developing adults). No significant differences were found in smiling intensity between the DS group and the control group of typically developing adults. However, there was a trend towards significance. It is possible that the significant differences that have been investigated between individuals with DS and those who are typically developing tend to weaken as age increases. It is quite possible that changes take place later in the development of individuals with Down Syndrome that may not be present during infancy and preschool. Studies have not been conducted with adolescents who have DS. The Smith and Dodson (1996) study touched upon sad emotions, but found that typically developing adults and adults with DS tended to show no emotion when a sad-eliciting stimulus was presented. Although the participants in this study were adults, similar results to those found by Carvajal et al. (2000) were found. Individuals with DS did not differ in their frequency of smiles when happiness was elicited in the study presented by Smith and Dodson (1996) and Carvajal et al. (2000).

Studies have investigated facial expressions created through emotional expressive tasks, such as free-play with their mothers, as well as through emotional responsive elicitation tasks, such as viewing video clips. Yet, the elicitation task does not seem to manipulate or influence the results. The variable that could possibly influence the findings may be age and the developmental stage where the participants have reached. Not enough studies have been conducted using participants of all ages, especially those between infancy and adulthood, to be certain of whether or not this variable does impact the findings. Other aspects to be investigated are whether individuals with DS are able to recognize other people's expressions, and whether other people are able to recognize expressions exhibited by individuals with DS.

Recognition of other people's expressions may be hindered due to the known cognitive and physical delays connected to DS. Children with DS are generally slower when learning to speak and often have a difficult time articulating. They also have problems interpreting information encountered in their own environment, or discriminating and attending to information around them (Hetherington & Parke, 2003). Adams and Markham (1991) conducted studies with children and adolescents with mental retardation on whether they were able to recognize facial expressions as compared to children and adolescents without any form of retardation (DS is a cause of mental retardation). When children were compared on a chronological age level (CA), children with mental retardation were significantly less correct in recognition of expressions. When they were matched by their mental age (MA), no differences were found between primary school-age children with mental retardation and typically developing children, but a significant difference was found with high-school-age individuals. Recognition

seems to decrease in people with mental retardation, when compared to their MA match without mental retardation. A study by Xeromeritou (1992) used a task similar to that used in Adams and Markham's (1991) study. Results showed no differences between the two groups with regard to identification of sad, happy, angry, and scared expressions. The most correctly matched expressions were found to be happy and sad expressions. McAlpine et al. (1991) studied adults and children with mental retardation in their abilities to recognize facial expressions in pictures. Children with mental retardation recognized 10 of the 24 expressions correctly; adults with mental retardation were able to identify 7 of 24 correctly. As participants with mental retardation age, their abilities to recognize facial expressions decrease. The concept of social learning of facial expressions could not be utilized in the explanation of the results. This study differs from the others because the severity of mental retardation was a variable. As expected, severity was important in recognizing expressions correctly.

The three recognition studies that were introduced discovered distinct results. Adams and Markham (1991) found that children and adolescents with MR recognized significantly fewer expressions than did the non-MR participants. On the other hand, Xeromeritou (1992) found no difference in recognition abilities between the two groups of children. Finally, McAlpine et al. (1991) found that as age increased in the participants with MR, the less correct they were in identifying expressions.

With regard to development, unlike eliciting of expressions among participants with Down Syndrome (Smith & Dodson, 1996), recognition of expressions appears to decline (McAlpine et al., 1991). Mutual understanding of facial expressions is very important when we socialize with others. It is also important to gain knowledge in areas

where nonverbal communication is used, where our understanding can go wrong, as well as an individual's coding of expressions.

Another study examining adults' recognition of facial expressions in children with and without MR was conducted by Maurer and Newbrough (1987). In this case, the participants performing the recognition tasks were adults with and without MR. Pictures were presented to the adult participants of children with and without mental retardation. The findings from the typically developing adult participants were that they were able to recognize facial expressions such as happiness, neutrality, and anger better than those participants with MR, when looking at pictures of both types of children. The two groups of participants did not differ in their identification of sadness. In addition, neutral expressions shown by typically developing children were recognized as correct more frequently than were neutral expressions of children with MR. With that said, it seems that there are certain expressions that seem to be more comprehensible to others, when displayed by a child who does not have a mental retardation. If one can apply the findings of the above study to children with Down Syndrome it can be concluded that they may not elicit the same facial expressions of neutrality as individuals without DS.

Similar to previous studies by McAlpine et al. (1991) and Adams and Markham (1991), adults with MR were less able to recognize expressions correctly, compared to adults without MR. Maurer and Newbrough (1987) also found that neutral expression exhibited by children without MR were better recognized than the neutral expressions displayed by children with MR.

The studies reviewed found contradictory information, regarding expressions by infants, children, and adults with DS with regard to their recognition of other people's

expressions and other people's recognitions of their facial expressions. Therefore, more information regarding facial expressions of children with Down syndrome is needed. The feeling of confusion and misunderstanding is one that can be overcome with more research.

Purpose of Study

Although there are many studies of expressions among infants, young children, and adults with Down Syndrome (DS), facial expressions among teenagers and adolescents with DS have not been sufficiently investigated. The purpose of this study was to examine if there are differences between Down Syndrome and typically developing 10- to 15-year-old children in their expressions of anger, disgust, and happiness.

Research Questions

Is there a difference in facial expressions between 10-15-year-old children with and without Down Syndrome when anger, disgust, and happiness are elicited?

Significance of Study

This study aims to clarify previous contradictory findings by investigating an age group that has not been examined in the past. This will improve our knowledge about Down Syndrome and, in return, assist teachers, parents, and other individuals who work with individuals with Down Syndrome to better understand and communicate with them. The differences that are found between individuals with and without DS may not be apparent for most people. However, these differences may be visible and distinct for those who spend long periods of time (e.g., parents, teachers, social workers, etc.) with

individuals with DS. The more knowledge that can be shared and learned, the better able we are to comprehend individuals with DS, just as we would with typically developing individuals who are able to communicate verbally.

Limitations

In the present study, limitations were found in the groupings of the participants. I was not able to pair the control group and experimental group according to their mental age. This is important because the chronological age may possibly not match their mental age due to the delays caused by Down Syndrome. By matching the participants on their mental age, researchers would be certain that both experimental and control groups would have reached a cognitive development stage that would be similar to each other's. A further limitation in this study was the small sample sizes. A larger sample size would have allowed results to be extrapolated to a larger population. The young age of the children limited the variety of video clips that could be used. Longer clips, and clips that elicit specific expressions more intensely, may have produced different results. Finding age-appropriate clips that not only elicit targeted emotions, but also are simple enough for all subjects to understand is an important factor, which may have limited or affected the results found in this investigation.

Definition of Terms

Down Syndrome (DS): A genetic disorder that occurs in 1 in 800 births, that causes mental retardation and physical delays. The degree of impairments is sometimes categorized as mild, moderate, or severe. Physical characteristics include: an upward angle of the eyes, a lack of muscle tone, large tongue, and a flat profile of the face.

Trisomy 21: One type of DS, where an error in cell division during conception occurs, and results in the baby having 47 chromosomes instead of the typical 46. The extra chromosome is found in chromosome 21.

Translocation: One type of DS, which occurs when part of chromosome 21 breaks off and attaches to another chromosome. This is only found in 3-4% of cases.

Mosaicism: One type of DS, which occurs after fertilization. The cells within an organism have different number of chromosomes, such that some cells contain 46 chromosomes and other cells contain 47 chromosomes (National Association of Down Syndrome [NADS], "What Is Down Syndrome?", 2005).

Emotional Response: An emotional reaction to a stimulus, such as a video clip.

Emotional Expression: A way of communicating or expressing emotions that have transpired through every day conversation or occurrences.

Typical Development: A child who is reaching the developmental cognitive, physical, emotional, social, and language milestones at guideline ages provided by physician.

Mental Age (MA): A measure of mental development.

Chronological age (CA): The number of years alive from the time of birth until the present.

CHAPTER 2

LITERATURE REVIEW

One form of communication, so necessary in our society to understand and interact with each other, is facial expression. "A picture paints a thousand words, but so can a face" (Fullagar, 2003, p. 74). We must, therefore, become better acquainted with facial expressions, especially for individuals with Down Syndrome. In the available research on the subject of facial expressions in DS individuals, particularly children, many of the findings are contradictory. A better understanding of the studies may occur through an in-depth examination and discussion of the implications.

Infants and Preschoolers

Research investigating facial expressions has been conducted with infants and preschool children with and without Down Syndrome. Kasari et al. (1990) examined affective responses of children with Down Syndrome (DS) and children who were typically developing. Thirty children in the control group (chronological ages ranged from 15.2 - 22.6 months) and 30 children in the experimental group (chronological ages ranged from 22.9 – 43.0 months) were matched on their mental age (MA). Behavior observations took place and were coded using the Early Social Communications Scale, intended to measure prelinguistic communication. For the assessment to take place, an experimenter and the child sat facing each other. There were toys in view but out of

reach of the child. The experimenter was to present each toy to the child and integrate the toy into a game where they both played. The experimenter also started activities where the child had an opportunity to take turns with the toy or was found in a situation where the child must make a request for a toy. These sessions were videotaped and coded (8 minutes of each session per child) for the child's nonverbal behaviors, child's attention, and the child's expressions. Expressions were coded using Maximally Discriminative Movement Coding System (MAX), an "anatomically based system for coding discrete movement changes related to emotion in three regions of the face" (Kasari et al., 1990, p. 59). Finally, expressions coded were placed into four categories: neutral, interest, positive, and negative. Focusing on affect expressions, the results showed that children with Down Syndrome (DS) showed more neutral and positive expressions as compared to the control group, but in duration, there was no significant difference between the groups. No significant difference was found between the control and experimental group when interest and negative expressions were compared. Another finding was that both groups expressed as many positive expressions when looking at people rather than objects.

The findings in this study (Kasari et al., 1990) indicate that children with DS in comparison to children who are typically developing are similar in duration of positive expressions, but not when examining frequency of positive expressions. Children with DS showed more shifts in expressions, which "suggests greater lability on the part of the children with DS" (p. 64). In this respect, an assumption can be made that at this age, children with DS do not differ from those who are typically developing in duration of

affective expressions. On the other hand, frequency of neutral and positive expressions did differ between the control and experimental groups.

An experimenter was used to elicit and assess the child's nonverbal behaviors, attention, and expressions (Kasari et al., 1990). This was an unknown person to the children, which may have lessened the expressions shown by the children. If it were a parent eliciting the behaviors, investigators may have found more frequent positive, negative, neutral, and interest expressions, and duration may have differed between the groups as well. Since affect was being assessed, developmental stages were of importance. In this study, developmental delays were controlled for, since the groups were matched according to their mental age; thus, the children were assumed to be in the same stage of development.

Reddy et al. (2002) investigated humor and laughter in preschool children with Autism (19 participants) and Down Syndrome (16 participants). To match the two groups, the Bayley Scales of Infant Development was used in order to determine the child's developmental age. A cross-sectional design was used to conduct the study, in which parents were interviewed, questionnaires were filled out, and free play with toys was videotaped. Investigators asked parents to describe types of events that elicit laughter in their children such as teasing by the child, teasing by the parents, trying to make others laugh, or through trying to fit in and joining others. It was found that there were no significant differences in frequency of laughter reported by the parents during interviews in both groups of children (Autism and DS). A difference was found in the types of events that caused the laughter in children. A significant difference was encountered when laughter was the response to inappropriate acts: "Fifty percent of the

children with DS reportedly did so" (p. 225). No significant differences were found between the groups on laughter being elicited through visual events (silly movements made by others). A significant difference was found between children with Autism and DS when eliciting laughter by replicating acts that had previously made others laugh. The videotapes were coded, and results showed a significant difference in groups relative to children's laughter with an external target. Significantly, less laughter was witnessed in children with Autism than in children with DS. No differences were found in solitary laughter between the groups, but a difference was found in the child's reaction when others laughed in the room. Children with DS significantly responded with a smile or a look towards that person, unlike the groups of children with Autism.

Due to the use of interviews as one of the forms of data collection, a bias could be found from the parents supplying the data. Parents wish for their children to appear as typical or as sociable as possible, which may hinder their answers to specific questions that had been asked during the interviews. For example, "Does she/he laugh or try to join in when others are laughing, when she/he doesn't understand what it's about?" (Reddy et al., 2002, p. 228). It was noted that if parents needed a more direct question, the interviewer would provide such a question. Also, because the number of participants was minimal, the results should be observed with caution. A very viable method taken by the researchers in this study was to match participants by their developmental age instead of chronological age. Due to certain developmental factors, such as the child's ability to be able to make others laugh on purpose, it was a useful way in which the researchers were able to factor that possibility out when detecting significance in results. A variable that was not discussed was echolalia. "Echolalia is a form of communication in which a

student echoes other people's language by constantly repeating a portion of what he or she hears" (Turnbull, Turnbull, Shank, & Smith, 2004, p. 285). This has been found to be common in children with Autism, but was not found in this study, either to make others laugh or when reacting to others' laughter. In these two contexts, it was found that children with DS significantly reacted more to others' laughter and were able to make others laugh through replication of actions that had previously elicited laughter.

Echolalia has been associated with language, but may possibly also be associated with laughter. Although not the case in this study, perhaps it should be looked at in the future. Of course, the comparison group in this study was not typically developing children.

Carvajal and Iglesias (2000) conducted a study that may clarify certain aspects of the previous two studies. Gaze and smiling behaviors were videotaped between infants and their mothers in their home environment. Fifteen infants were typically developing and 15 had Down Syndrome. Thirty infants were divided by age into three groups. Group 1 was comprised of 10 infants between the ages of 3.2 – 4.6 months, group 2 included 10 infants ages 6.2 – 8.8 months, and finally group 3 was comprised of 10 infants ages 10.8 – 13.6 months. Behaviors being analyzed from the videotapes were: looking behaviors by infants (at mother's face), looking at toys, looking somewhere other than at mother's face or toys, and smiles. A smile was coded as "presence of lip corners pulled, action unit or AU 12 of the FACS" (Carvajal & Iglesias, 2000, p. 227). FACS is known as the Facial Action Coding System, which codes facial actions by examining 44 different units. Results show that mothers of children with and without DS did not behave differently from each other. The only difference found between mothers' behaviors was their choice of toys. Mothers of children without DS used toys that made

sounds and had no facial features significantly more than those mothers with DS children. Children with Down Syndrome looked at their mother's face significantly more than typically developing children, but both groups of children smiled more at their mother's face than they did at toys. Age was not a significant factor for the smiling variable, but was a factor when analyzing infants' gaze. Younger infants (of both groups) looked at their mother's face longer than the older infants. Infants both with DS and without DS are capable of distinguishing toys from their mother's face; this is shown by their smile, from which both groups were found to be similarly able to distinguish the two.

The problems found in the previous studies, such as using experimenters instead of a parent and parental bias found in interviews, were cleared up in this investigation (Carvajal & Iglesias, 2000). Infants played with a known face (mother), and seemed to smile more often with mom than at the toys. The videotape of child-mother interaction removed parental interview answers that may have been biased. The comparison group was also typically developing children.

Contrary to previous experiments, Sorce and Emde (1982) conducted a study in which infants with Down Syndrome and typically developing infants interacted with their mothers in their home environment. Ten mother-infant pairs participated while infants were 3.5-4 months old. Pictures were taken of interactions with child-mother, child-experimenter, and a non-social situation where the child was left alone. These pictures were shown to the infant's mother, who was asked to describe in words what her child was feeling. The most common emotions mentioned by mothers of children with and without DS were high/low enjoyment, high/low interest, and drowsiness. Eighty-five percent of typically developing infants' mothers said their infants were feeling these

emotions, compared to the mothers of the children with DS, who believed their infants elicited these specific emotions 88.3% of the time. More specifically, in comparison with mothers of children with DS, mothers of typically developing infants reported their infants as showing significantly more high intensity expressions (especially enjoyment and interest) and a smaller number of expressions considered to be low in intensity (interest).

A second study (Sorce & Emde, 1982) was conducted using the same photographs, but the participants viewing the pictures in this study were 30 mothers of infants the same age as the infants in the pictures, but strangers to the participating infants. This was done in order to find out if there was a difference between groups of mothers in an attempt to reduce parental bias. In this case, mothers were to place the pictures under categorical labels of emotions (emotions indicated by previous study) they believed infants were feeling. Mothers recognized significantly more high intensity expressions of enjoyment from typically developing infants in comparison to infants with DS. They indicated typically developing infants as showing significantly fewer high/low intensity of interest and also fewer drowsiness expressions.

Both parts of the study conducted by Sorce and Emde (1982) found differing information in comparison to previous findings where children with DS were found to exhibit significantly more positive affect in comparison to typically developing children. In this case, children with DS were found to elicit less enjoyment expressions in contrast to the control group. More infants with DS were also significantly exhibiting low intensity expressions, especially when showing emotions of interest and drowsiness.

Using different eliciting techniques, Cicchetti and Sroufe (1978) conducted a study with 120 infants with DS and 90 typically developing infants. They were observed at 4, 8, 12, and 16 months of age. In order to elicit expressions, children were exposed to a visual loom, and a visual cliff. The object that would loom over the child was a red diamond with a black cross, which either loomed toward the child or loomed and missed by traveling to the left of the child and out of sight. The visual cliff was a Plexiglas platform. When the child looked through it, they saw a shallow end and a deep end. Their mothers on one side encouraged them by calling them or making use of toys. Behaviors and expressions (defensive arm movements, blinking, withdrawal, turning away and crying) were being videotaped for coding. The focus was on crying because it is a negative expression used by infants. Results using the visual loom show that the 4- and 8-month-old infants with DS did not cry, but 6% of the 12-month-old children cried when looming was coming straight to their visual field. Of the 16-month-old children, 37% of them cried. On the other hand, 3% of 4-month-old typically developing children cried, 33% of the 8-month-olds cried, and 57% of the 12-month-old children cried. When the object misses the child and retreats from view, no significant difference is found in expressions by 4-month-old infants. Significant differences were found as the children were older. At 8, 12, and 16 months, fewer children with DS cried compared to typically developing children. When experimenters matched 12-month-old children with DS and 8-month-old typically developing infants (rough cognitive match), the same was found, where typically developing children cried more than the children with DS.

Cicchetti and Sroufe (1978) found that when the children were placed onto the Plexiglas (visual cliff), all the children with DS crawled without restraint on the shallow

side of the visual cliff. Only 9% of all infants with DS crossed from shallow to deep end of the visual cliff and only 11% cried. No comparisons were made to typically developing children in this scenario.

This study (Cicchetti & Sroufe, 1978) examines crying, a negative expression of emotion. In most of the studies considered, significant differences were not found between the control groups and experimental groups when investigating negative expressions. In this study, significantly more typically developing children were found to cry more readily than children with DS, especially as the children got older.

Finally, a study conducted by Joseph and Tager-Flusberg (1997) contradicted previous findings yet again. The children chosen to participate in this study were older than those previously reviewed. An examination of visual attention and facial affect of 6 children with Autism and 6 children with Down Syndrome was conducted with matching on chronological age and language levels. The mean age of the children with Autism was 63.7 months and mean age of children with DS was 60.5 months. The study took place over a period of 24 months, where videotaping took place of mother-child interaction in their homes. After an hour of play, the experimenter gives the child a wrapped gift and mothers were to help their children play with the new toy. The main focus was on the child's reception of the gift and what followed thereafter. Affect was coded using four categories: neutral/interested, positive, negative, and mixed/ambiguous. Results showed that children with Autism exhibited a larger proportion of time expressing neutral/interested affect as compared to children with DS. On the other hand, children with DS were found to show a significantly higher frequency of positive affect compared to children with Autism. It did not matter whether it was with their mother, the

researcher, or paying attention to toys. However, when comparing duration of positive affect between the two groups of children, a significant difference was not found.

In this study, frequency was found to be significantly different when comparing the two groups in positive affect interaction, whereas in the study by Reddy et al. (2002), frequency of laughter was not found to be significantly different. There is a possibility that this may be due to an age difference. The children in this study (Joseph & Tager-Flusberg, 1997) were chronologically older than the participants in the Reddy et al. (2002) study. Similar to previous studies, children with DS did not display negative affect to the extent where there was a significant difference between groups. The sample size was small and thus the study's findings should be taken cautiously, but more research needs to be done in order to clarify the contradictions that have been found thus far. Mothers were also used as focus for eliciting affect in this study, and the children's having a familiar face during the sessions will result in reactions that are more natural.

Thus far I have reviewed studies that have taken place in a lab, such as that of Kasari et al. (1990) and in a home environment (Carvajal & Iglesias, 2000), but it did not seem to matter what type of environment the study took place in, because the results varied in both environments. Therefore, we can assume that the environment where the study takes place does not interfere with the investigation. Studies have been conducted with various age groups, and the results are still inconsistent with each other. The frequency of positive expressions, such as smiles, when the participants are infants (with and without Down Syndrome), seems to be similar between the two groups (Carvajal & Iglesias, 2000). As the children get older, and reach toddler years (between the ages of 2-5 years), a difference in frequency of smiles emerges. Kasari et al. (1990) found that

children with DS showed significantly more positive expressions than children without DS. Sorce and Emde (1982), on the other hand, had mothers rating pictures of infants that were taken during play sessions. They found that mothers rated infants without DS as exhibiting significantly more intense enjoyment and interest than infants with DS. This contradicts with Carvajal and Iglesias (2000) findings.

Negative expressions have been found to be dissimilar. Kasari et al. (1990) found that negative expressions between the groups of children with and without DS did not differ. Yet, Cicchetti and Sroufe (1978) found that infants with DS cried (negative expression) less than infants without DS. The same variety of results emerges from the studies conducted among children with Down Syndrome and Autism. Joseph and Tager-Flusberg (1997) found that children with DS showed more positive affect than children with Autism. However, Reddy et al. (2002) found infants with DS and Autism did not differ in frequency of laughter. They did find that triggers to elicit laughter differed between the groups of infants.

Overall, studies have elicited expressions in many different ways and have found many different results. This may be due to the age of the child, since the studies examined have observed infants and preschool-age children. Further in the review, a study conducted by Smith and Dodson (1996) shows results of adults with DS in which the groups of adults with and without DS are similar in frequency of smiles and in their response to sad and neutral film clips. Thus, it may be possible that due to the young ages of the studies such as Reddy et al. (2002), and Carvajal and Iglesias (2000), Kasari et al. (1990), Sorce and Emde (1982), Joseph and Tager-Flusberg (1997) and Cicchetti and Sroufe (1978) may influence the diversity of the results discovered. There may be a

need for developmental growth in order for investigations to take place on their facial expressions. Since children with DS are developmentally delayed in some or all areas, it does take them longer to process what they are seeing and exhibit an expression of what they feel. Suggestions for future studies would be to examine older children and use other forms of elicitation that have also been proven to work in extracting emotions.

Adults

With such contradictory findings in previous studies, let us move on to older participants. Children in the previous studies may have not fully developed certain expressions to exhibit their emotional state. By the time participants are adults, investigators believe that they have been exposed to many facial expressions (socially) and have developed the emotions that are being examined. Smith and Dodson (1996) investigated facial expressions in adults with Down Syndrome. They videotaped participants while watching video clips that were meant to elicit happiness, sadness, and neutrality. Ages of participants ranged from 20 to 53 years old, and were divided into two groups. The experimental group was made up of 15 adults with DS and the control group consisted of 20 typically developing adults. A rating scale was used to rate participants' emotional responses to the video clips. For simplicity, cartoon drawings of happy, neutral, and sad faces were the scale, where participants would circle the face that best represented their emotion after viewing a video clip, which were each 10 seconds long: 12 happy, 12 neutral, and 12 sad. Participants were tested alone in a room, where the investigator explained to them the rating scale and informed them of the video camera that would be taping them as they watched the clips on television. Facial Action Coding

System (FACS), which was used to code facial expressions, "describes visible facial movement on the basis of an anatomical analysis of facial action" (p. 604).

Findings suggest that adults with Down Syndrome (DS) have the same emotional responses to happy stimuli compared to the control group. The percentage of cheek-raised smiles was also similar for both groups. Unlike the control group, adults with DS did not show many smiles without cheek raises and would show no expression for clips that would otherwise elicit just a smile in control group participants. Associated with this finding was that adults with DS rated "their self-reports of emotional reactions, rating happy vignettes as happier and sad stimuli as less sad than did control adults" (Smith & Dodson, 1996, p. 607). It was suggested by the experimenters that their present mood was happier than the control groups, and thus would influence their ratings of emotions while watching video clips. When sad video clips were shown, the main response by both groups was none at all. Control group participants showed lowering of brows when movement was made during the sad video clips. The experimental group showed brow raises and small smiles when movement was shown. During neutral clips, no expressions were shown for either group. Due to the lack of expressions exhibited while sad and neutral clips were being shown, investigators decided not to investigate further.

Results have shown that adults with DS react similarly to emotion-eliciting stimuli as do the adults in the control group. Sad and neutral expressions were lacking in both groups of participants, which seems to be the pattern found in the articles previously evaluated. The response of only-cheek-raised smiles by DS participants for what they viewed as happy clips may be due to the eagerness they may have felt to please the experimenter. Another reason for this specific expression was also mentioned, that being

their present affective state which may have influenced their expressions. With regard to the lack of expressions while watching sad and neutral films, it may have been that the short 10 seconds given to each clip chosen to elicit certain emotions may not have been intense enough to invoke a full response. The investigators did not use video clips used previously by other studies to elicit emotional responses. They conducted their own pilot studies of clips they believed would elicit sadness, happiness, and neutral expressions. Using video clips that have been previously used with success to elicit emotions may have resulted in different findings when focusing on sad expressions.

This study by Smith and Dodson (1996) conducted a similar investigation to what I have reviewed in previous studies, with regard to facial expressions of individuals with and without Down Syndrome. Differences in their investigations lie in their participants, and the task that took place for expressions to be elicited. Unlike previous studies, such as Cicchetti and Sroufe (1978) as one example of prior studies, who had infants (4, 8, 12, 16 months) in their investigation, the participants that took part in this study were adults between the ages of 20 and 53 years old. Another variation to the aforementioned studies was the way in which Smith and Dodson (1996) chose to elicit facial expressions in their participants. Video clips were shown to each individual participant, and their expressions were video taped as they watched the 12 happy, 12 neutral, and 12 sad clips. Not only did the results come from an analysis of the video taken of the adult's expressions, but the investigators also had the participants fill out a rating scale after each video clip, to rate their emotion while they watched the clip. This was not a procedure used by studies such as Kasari et al. (1990), mainly because the participants were of a young age.

The results of the study by Smith and Dodson (1996) were similar to those found

by Carvajal and Iglesias (2000), where individuals with DS did not differ in frequency of smiles in comparison to individuals without DS. Also, Smith and Dodson (1996) found no differences in expression when the sad and neutral clips were shown. This is similar to findings by Kasari et al. (1990), whose results showed no differences between infants with and without DS when comparing negative expressions. Unfortunately, this was the only study that could be reviewed whose participants were adults with Down Syndrome. Further research will follow of other studies that used film clips to elicit expressions, as well as studies where adults do take part in recognizing other's expressions. This way we can learn more about the advantages of film clips to elicit facial expressions in individuals who are older than the toddler and infant population that has been studied and analyze other studies and additional possibilities for such varying results in prior studies.

Use of Film Clips to Elicit Emotions

Film clips have been used readily to elicit facial expressions in typically developing individuals, but seldom used when working with participants who have Down Syndrome. In a study by Gross and Levenson (1995), 494 undergraduate students between the ages of 17-43 participated. After each of 78 films were shown to groups of participants, they filled out an emotion self-report inventory. Experimenters wanted to elicit eight emotions (anger, amusement, contentment, disgust, fear, sadness, surprise, and neutrality) through the showing of the films. From the 78 films, the best two films were chosen for being successful at eliciting the target emotions. Further details of the 16 chosen films can be found in Table 1. Investigators found only one film that was successful at eliciting anger (*Cry Freedom*) and contentment (*Waves*). No film was found that would elicit fear, but instead the films used elicited greater levels of interest.

The films chosen to target amusement, disgust, and sadness did so in 80% of the participants.

Another influential study that used film clips to induce emotional states was that of Philippot (1993). Sixty participants, between the ages of 18-25 years, volunteered to take part in this study. They were shown six film clips (either film series I or II) and were asked to rate their success in eliciting target emotions (anger, joy, fear, disgust, sadness, and neutrality). Full details of the films used can be found in Table 2.

Questionnaires used to measure participants' emotional states were the Differential Emotional Scale, Semantic Differential, and the final one was an open question to describe their emotional state using three adjectives. Results show that film order did not influence elicitation of target emotion. Films that were to elicit fear or anger were shown to elicit both at the same time. The same was found when anger and disgust were to be elicited. Otherwise, all films were successful at eliciting the target emotions.

Personality characteristics are important when participants are rating their emotional states after viewing a film clip, since each individual has different reactions to the same stimuli. Exposure is related to personality. Participants have had different types of exposure to film and may be accustomed to seeing films that elicit certain emotions, such as fear, that would render them to be less affected by the film.

Table 1

Best Emotion-Eliciting Film

Target Emotion	Film	Description
Amusement	<i>When Harry Met Sally</i> <i>Robin Williams Live</i>	Orgasm in restaurant Stand-up comedy
Anger	<i>My Bodyguard</i> <i>Cry Freedom</i>	Bullying Protesters ill-treated by police
Contentment	<i>Waves</i> <i>Beach</i>	Waves Scenes of a beach
Disgust	<i>Pink Flamingos</i> <i>Amputation</i>	A person eating dog excrement Amputation procedure
Fear	<i>The Shining</i> <i>Silence of the Lambs</i>	Little boy seeing ghosts and blood in a hallway Chase scene in the basement
Neutral	<i>Abstract Shapes</i> <i>Color Bars</i>	Shapes Color bars
Sadness	<i>The Champ</i> <i>Bambi</i>	A boy's father dies The deer's (Bambi) mother dies
Surprise	<i>Capricorn One</i> <i>Sea of Love</i>	Agents break down door Person frightened by pigeons

Note. From "Emotion Elicitation Using Films" by Gross and Levenson, 1995, *Cognition and Emotion*, 9(1) p. 94. Copyright 1995 by Lawrence Erlbaum Associates Limited. Adapted with permission.

Another variable that may be of interest for future studies or when analyzing these studies is that human beings have several emotional states at once, making it difficult to differentiate between certain states such as anger and disgust. Finally, the Philippot (1993) study was conducted in Belgium, and there is a probability that participants in a different country may have a different emotional reaction to the same films shown in his study. Studies using the same clips found to be successful in these studies should be conducted with different age groups and in different countries in order to examine whether these findings can be confirmed.

So far, this review has presented the literature on children with Down Syndrome's ability to produce emotions. However, it is also important to know if they can also recognize the emotions of other people.

Recognition of Other People's Expressions

Apart from age and developmental levels, it is also important to better understand whether individuals with DS are able to recognize other people's facial expressions. This is essential to research because many of us learn through socialization. If individuals do not interpret expressions appropriately, then they too will be confused about which expressions are connected to the emotions they are feeling. Too few studies have been published where children with Down Syndrome have participated in investigation where their recognition abilities of facial expressions were tested. Down Syndrome causes mental retardation, and thus studies of participants with mental retardation will be reviewed.

Adams and Markham (1991) investigated children and adolescents with mental retardation (MR) and without MR on facial expression recognition (Down Syndrome is a

form of mental retardation). Two tasks were presented to the children in each session. In one task, the experimenter shows the participants three pictures of a person's face, and asks the participants to show which picture is expressing a certain (happy, sad, mad, scared, surprised, and disgusted) emotion. The second task consists of the same three pictures of a person exhibiting a facial expression, but in this case participants were asked to look at an additional picture where the person is displaying an emotion, and the participants are to match this single additional photo with one of the three previously presented. The control group and the experimental group were compared on the basis of the same chronological age (CA) and also on mental age (MA).

Results show (Adams & Markham, 1991) that when participants with the same CA were compared, the experimental group of children with MR was significantly less correct in recognizing facial expressions on both tasks. No difference was found between the groups when they were matched using their MA on the first task, but a difference was found for the second task. Average percentages of specific expressions recognized were also investigated. For both groups, happiness and surprise were best recognized. Disgust, on the other hand, was the least recognized by the two groups.

Table 2

Film Series to Elicit Emotions

Emotion	Film	Description
Film Series I		
Anger	<i>The old gun</i>	A man remembers finding his wife and daughter dead. Killed by the SS during WWII.
Disgust	<i>Faces of death</i>	An animal slaughterhouse is shown.
Sadness	<i>Kramer vs. Kramer</i>	Parents have just divorced and the father is having some time with his son in a park.
Happiness	<i>Le magnifique</i>	French comedy spoof on James Bond.
Fear	<i>Psycho</i>	An eerie hotel murder by the tenant of the hotel who has multiple personalities.
Neutral	<i>Documentary</i>	Town policy documentary in Belgium.
Film Series II		
Anger	<i>Sophie's choice</i>	During WWII, woman is stopped by an officer and forces her to choose which of her children she will send to be killed in the gas chamber.
Disgust	<i>Faces of death</i>	The killing of a monkey in order to make a meal out of his brain.
Sadness	<i>Kramer vs. Kramer</i>	A recently divorced father is putting his son to sleep and explaining to him why his mother is not there.
Happiness	<i>Le magnifique</i>	French spoof on James Bond.

Table 2—Continued.

Emotion	Film	Description
Film Series II		
Fear	<i>Halloween</i>	The babysitter hears noises; goes to see what they are and finds the children have been murdered.
Neutral	<i>Documentary</i>	Belgian documentary of interviews with aspiring police officers.

Note. From "Inducing and Assessing Differentiated Emotion-Feeling States in the Laboratory", by Philippot 1993, *Cognition and Emotion*, 7(2), p. 177. Copyright 1993 by Lawrence Erlbaum Associates Limited. Adapted with permission.

Likewise, Xeromeritou (1992) investigated recognition of facial expressions by children with MR and children who were typically developing. Twenty participants in each group were matched on their verbal MA using the Peabody Picture Vocabulary Test (PPVT). Stories involving one of four emotions (happy, angry, sad, scared) were read to the children individually, after which participants were asked to identify what emotion was involved by pointing at pictures that exhibited four facial expressions linked with the four emotions. This task was known as the identification task. The second task was known as the production task because after the experimenter read the story (without mentioning an emotional label), subjects were asked to produce the word that the characters in the story must have been feeling. Once that was done, the pictures used in the first task were shown to participants and they were asked to once again point at the expression that best illustrated the emotions felt in the story.

Similar to previous findings, Xeromeritou (1992) found that during the identification task, there were no significant differences between the two groups. Unlike previous results, no significant differences were found between the two groups during the production task of the study. What was found was that during the production task, both groups were better able to correctly identify happy emotions as compared to the sad, angry, and scared emotions. The tasks reviewed in this study and in Adams and Markham (1991) are simple tasks where children are connecting the dots between emotions exhibited in stories or pictures and placing a facial expression to go along with it.

A study conducted by McAlpine et al. (1991) explores performance on similar tasks with groups of 128 typically developing children (ranging in age between 5-6 and 8-13 years) and 373 children, adolescents, and adults with different levels of mental retardation (MR). This study started the testing sessions differently from the others. Participants were asked the meanings of six emotions (happiness, surprise, anger, sadness, fear, and disgust), and those that were unable to give a definition were given the meaning of the emotion and illustrations were supplied if necessary. Participants who were still not able to vocalize their understanding of the emotions were shown pictures and asked to point to the emotions the experimenter wanted meanings for. After this procedure, the testing sessions with photographs began. Six photographs were shown to participants at once and the experimenter would say, "Some of them are sad, happy, surprised, frightened, angry, or disgusted" (McAlpine et al., 1991, p. 32), as an introduction to the pictures. Participants were then a told story, after which the experimenter mentioned the mood the characters are in and then asked the participants to

point to that same emotion in the pictures. This continued for each picture that was placed in front of the participants.

Results show (McAlpine et al., 1991) that children with MR identified 10 of the 24 facial expressions correctly, and adults with MR recognized 7 of the 24 correctly. Children without MR identified 21 of the 24 expressions correctly. Happiness was best identified out of all groups: children without MR were 100% correct, children with MR were 85% correct, and adults with MR were 83% correct. Fifty-five percent of the time that sadness was presented, children with MR identified it correctly. Fear, anger, and disgust were correctly identified only 50% of the time. An examination of the different levels of MR groups' results show that "children with borderline intelligence recognized all facial expressions of emotion more frequently (73%) than did their peers with mild (55%) and moderate (46%) MR" (p. 33). Adults with MR correctly recognized sadness, disgust and anger 46% and surprise and fear only 39%. In comparison, those children who are typically developing correctly identified sadness 95% of the time, anger 90%, surprise 83%, and disgust 88%, and finally fear, which was recognized 79% of the time correctly.

Comparing the three studies, this particular one (McAlpine et al., 1991) had adults with MR as participants and not just children. This was important since in this study it was suggested that as the participants with MR got older, the fewer correct responses they were able to give. Since it is just one study, results should be looked at cautiously. This study also showed that all levels of MR are capable of performing the tasks presented in all three studies, but touched on an important topic when investigating individuals with severe MR: They may not be able to verbalize their answers. As

expected, the levels of MR became more severe as the fewer correct emotion identifications were made.

Reviewing studies based on the abilities of children, adolescents, and adults with MR has revealed that happiness is identified easily, but other emotions, such as sadness, anger and disgust, are not correctly recognized. This is possibly one of the reasons why investigators have a difficult time eliciting these same emotions in participants with MR and, more specifically, Down Syndrome (DS). The better able a person is in recognizing facial expressions, the better able he or she is in associating the emotion with the facial expression. In this case, if individuals with MR and DS have trouble with recognition of facial expressions, then they will also have difficulty expressing their emotions appropriately for others to recognize. Subsequently, a further review of studies where children with DS and MR display expressions for others to recognize will take place.

Other People's Recognition of Expressions

Maurer and Newbrough (1987) conducted studies in which participants would look at pictures of children with MR and without MR and were asked to recognize the expressions. In the first study, participants themselves were adults with MR (mean age was 31.3 years old) and without MR (mean age was 34.3 years old). Participants were shown two groups of slides: one of children with MR and the other of typically developing children. Participants were to identify the emotions using labels such as "happy, sad, and just ok" (p. 506). Findings suggest that there is a significant difference in recognition of happy expressions by both groups of participants as compared to neutral, angry, and sad expressions exhibited by both children with MR and typically developing children. Adults without MR were better able to recognize neutral

expressions correctly as compared to sad and angry expressions. On the other hand, no significant difference was found in recognition of neutral, sad, and angry expressions exhibited by both MR and non-MR children, by adults with MR. "Non-retarded children's facial expressions were identified more successfully overall, which was due to the fact that their neutral expressions were recognized more accurately by all participants and their sad expressions by the nonretarded adults" (Maurer & Newbrough, 1987, p. 507).

Happiness seemed to be recognized very easily, yet adults with MR had trouble identifying other expressions. Expressions being exhibited by children with MR were recognized correctly less often than were facial expressions exhibited by typically developing children. With labels for expression given to the participants, it should have been a simple task for adult participants; thus, their differences in identifying expressions exhibited by both groups of children depend on the child's displays. They may not exhibit expressions as intensely as children without MR, or they may exhibit an expression that could be a combination of two different emotions.

The second study conducted by Maurer and Newbrough (1987) used the same pictures of expressions being exhibited by children with MR and typically developing children. The difference was the adult participants. One group consisted of adults who had never had an experience with children with MR, group 2 consisted of parents of children with MR, and the final group included teachers of the children exhibited in the photographs. As expected, adults without experience with children with MR were less accurate at identifying their expressions. There was a significant recognition difference by this group of adults when comparing recognition between expressions exhibited by

typically developing children and children with MR. Sadness was the main expression that was correctly identified in typically developing children, but was not able to be identified correctly in children with MR. Teachers were able to recognize their students' expressions significantly better than the typically developing children who were not their students. Teachers were better able to recognize children with MR's expressions as compared to parents, who were better able to identify expressions exhibited by children with MR compared to adults without experience.

These two studies are a perfect example of the reasons why we need to conduct more research and gain additional knowledge about children with DS and their facial expressions. Teachers who worked with children with MR were well acquainted with their expressions, and parents of children with MR were also better able to recognize their expressions as compared to someone who does not have any experience working with these individuals. Parental recognition of expressions from children with MR also demonstrates the similar expressions that are exhibited by individuals with MR. If not, they would not have been significantly different in their answers compared to adults without experience. Basically what we can gather from the two studies by Maurer and Newbrough (1987) is that expressions exhibited by children with MR are different from those exhibited by typically developing children, and that there is an urgent need for us all to educate ourselves to understand nonverbal communication in all groups of individuals.

One other study that solidified results previously viewed was investigated by Hyche et al. (1992). In this case, mothers were instructed to watch videotapes of infants with Down Syndrome (DS) and typically developing infants, and then press a button

when they thought the infant was trying to communicate. The mothers participating in this study were mothers of children with DS and mothers of typically developing children. The infants in the videotapes were grouped into three age groups: 7, 10, and 16 months old. Results showed that mothers viewing infants with DS at 7 months found it difficult to identify when the infant was signaling or communicating. It did not matter whether it was mothers of children with DS or mothers of typically developing children; both had difficulties. When observing older infants with DS, mothers rated their communicating behavior as equivalent to the ratings while viewing typically developing infants. This may suggest that mothers of children with DS respond to smaller cues or notice smaller cues, and that is why the rating was similar for both groups of infants. It may also be that infants at this age are developmentally alike and thus do communicate in comparable amounts.

Summary

I have discovered that when children are young there seems to be contradictory evidence regarding their facial expressions. Findings suggest a difference between children with DS and typically developing children in terms of frequency of exhibiting positive expressions, but not when observing duration of the same expression. Children with DS have been observed to exhibit more positive expressions. Yet, studies have found no significant differences when DS and non-DS children are smiling at their mothers. Studies reviewed now investigate adults with DS and their facial expression elicited by film clips. No difference was found between adults with DS and typically developing adults when happiness was elicited, instead, it was found that adults with DS tended to smile with cheek raises every time they smiled, compared to typically

developing adults who had slight smiles, cheek-raise smiles, etc. Both groups did not show much emotion in their facial expressions when watching sad clips. No studies have been conducted where elicitation of facial expressions was conducted by showing videotapes to children and adolescents, only adults. Also, if the discussion concerns development of emotions and learning facial expressions associated with these emotions, then there should also be a sample group that should be researched that does not include adults or young children. There needs to be a study of a sample group of teenagers that elicits facial expressions from viewing video clips previously used to elicit target emotions. Another reason to investigate this sample age group further is the fact that this age group has adolescents who are exposed socially to other people's expressions. The studies that were discussed in this chapter have conducted experiments with children and adults with DS recognizing other people's expressions. In addition, there have been experiments where adults have viewed pictures of children with MR and tried to recognize their expressions, but still no studies with adolescents.

Essentially, too few studies have been conducted with adolescents with Down Syndrome (DS) and their nonverbal communication skills, such as facial expressions, which seem to be a problem for strangers to understand. Comprehending what others feel and think is essential, and verbalization is not the only form that we use to express our thoughts and feelings.

CHAPTER 3

METHODOLOGY

Participants

The participants in this study were between the ages of 10 and 15. A control group (children without Down Syndrome) was chosen from Ruth Murdoch Elementary School and Village SDA Elementary School, due to their proximity to Andrews University, and from the Berrien Springs School District. Since the number of children was still too low, Roywood Public School in Toronto, Ontario, also participated. The experimental group (children with Down Syndrome) was chosen by contacting Down Syndrome organizations who made parental lists available for me to seek volunteers for the experimental group; they also made their website available to me, where I posted a letter explaining the investigation and my search for volunteers (see letter in the appendix). The three Down Syndrome organizations I contacted and attained participants from were: The Down Syndrome Association of Western Michigan, The Down Syndrome Association of Northeast Indiana, and The Down Syndrome Association of Toronto.

For the selection of the control group, the school principals provided a list of students and each child received a number. Following the designation of numbers to students, randomization was carried out with the use of a random number table.

Unfortunately, not all of the participants who were randomly chosen opted to take part. Thus my participants consisted of the individuals that wanted to participate, as a result randomization did not take place. The sample size for the control group was 9 children. Due to the small number of available participants with Down Syndrome, randomization did not take place. All those who contacted me and were interested became participants of the study. Five children made up the sample of the experimental group. Children with Down Syndrome had already been diagnosed by their physicians as having DS. Therefore, no further confirmation testing had to be done.

Materials

A VCR, television, and video camera were the necessary equipment for the experiment. The film clips that were shown using this equipment were from *Funniest Home Videos*, *Harriet the Spy*, and *Fear Factor*. A neutral film clip was also shown in between the emotion eliciting clips (neutral film of basic shapes), which was taken from *Brainy Baby: Shapes*.

Procedure

The present study was a two-group comparative design in which facial expressions in children with and without Down Syndrome were compared. This comparative study was conducted to learn more about the differences and similarities in facial expressions between the children with and without Down Syndrome.

Previous studies have indicated that film clips are better at eliciting emotions. "Film clips have been found to elicit emotions of higher intensity than slides" (Hagemann et al., 1999, p. 268). Thus, film clips were chosen for this investigation.

Interested participants were placed into a control group (children without Down Syndrome) and an experimental group (children with Down Syndrome). Parental permission was obtained before the children took part in the study. Parents had the opportunity to view the video clips prior to giving their consent. Participants and their parents/guardians were able to select between three dates (after school) that best accommodated their schedules in order to attend the Andrews University counseling center where the video clips were shown to each participant individually. A room in the counseling center was made available for the showing of the clips, as well as to videotape the children's facial expressions as they watched the emotion-eliciting clips. For those children randomly chosen from cities further away, an option to parents/guardians was made available to conduct the experiment in a school classroom close to their home.

The participants were informed of their right to leave anytime they wanted to, and reminded that since they were volunteers in this study, if they chose not to finish it, no reproof would occur. Also, a school counselor was made available for consultation if parents/guardians wished further discussions. If there were questions, I was available to answer them before and after the investigation. The participants were informed that the information I was acquiring would be kept confidential. No names were used in the written report, and no other individual had access to their personal information or the information that was produced while viewing the video clips. The participants and their parents/guardians were also notified that if the parent/guardian wished, they were able to sit just outside of the viewing room, in an adjacent waiting room.

Once this information was shared, the participants were taken into the viewing room where they were instructed to sit down, relax, and enjoy the clips. The experiment

took about 10 minutes. The participants were told that this experiment was about television viewing and once the videotape was over, they would be told that they may leave the room. As the children watched the video clips, a video recording of their expressions took place. Parents/guardians had knowledge of this fact, but the participants did not. This was done in order to be able to capture a true emotional response from the participants, and not one that they believed was what the investigator wanted or was expecting.

Due to the fact that the video clips shown had not been used in previous studies, a pilot study was conducted. Four parents, two children with Down Syndrome, and two children without Down Syndrome were shown clips that had been approved by the Andrews University Institutional Review Board. More video clips were shown than were necessary for the study. Facial expressions of parents and children were videotaped and parents were asked questions regarding the appropriateness of the clips before showing them to the children. The children were also asked questions regarding their emotional states as they watched each emotion-eliciting clip. Four observers were trained by the researcher to code facial expressions viewed from the videotapes in order to choose the emotion-eliciting videos that triggered the emotions targeted. The coding of facial expressions used in the pilot study was the same codes used in the present study. From the answers the children and parents gave, as well as the expressions coded, video clips were chosen for their appropriateness and ability to elicit the target emotions that were being studied for this investigation.

A similar procedure has been used in studies such as Philippot (1993), Gross and Levenson (1995), Hagemann et al. (1999), and Tomarken, Davidson, and Henriques

(1990). One difference in this study is the number of video clips shown, which were only three emotion-eliciting clips and a neutral clip in between each emotion-eliciting scene, compared to the greater number of clips shown in the studies mentioned, such as Philippot (1993), where he used 12 clips including neutral clips. A second variation from previous procedures was that the participants were not asked to fill out a questionnaire, such as the one used in Gross and Levenson (1995), which was a self-report on their emotions at the time they viewed the clips. Questionnaires were not used in this experiment because the experimental group was made up of children who are cognitively challenged and who may not be able to perform the task of filling out questionnaires, or fully understand what was being asked in the questionnaires. The age of participants also varies from past studies. This study included younger participants, which was an added justification for the study. The more information gathered with regard to different age groups and expressions, the better able we will be to understand this form of communication. Finally, the clips used in the study were not clips that had been used in previous studies, but like the studies mentioned, a pilot study did take place beforehand in order to choose appropriate video clips. Apart from these differences, I followed procedures from the previous studies.

As the participants watched the video clips, their facial expressions were videotaped. The videotape of the children watching the video clips were later analyzed using codes. The description of the anger code consisted of brows pulled together, lips scrunched together or clenched (lip narrows). The disgust code consisted of pulling upwards of central portion of upper lip, raising and stretching nostrils with a wrinkle on the bridge of the nose or sides of nose. The code for happiness was described as showing

cheek raises, resulting in wrinkles below eyes, and lip corners pulled upwards to show a smile. A neutral code was described as “essentially those that were devoid of any active movement in the face: the brow and cheek area showed no movement while the mouth was relaxed, either open or closed” (Kasari et al., 1990, p. 59). The codes were presented to four observers, who became familiar with what they were looking for when viewing the clips of the children’s expressions. The observers would make a mark next to the codes of expressions seen in order to calculate frequency.

Observers were not made privy to the investigation’s goals and past research; thus, they did not have a bias as to what it was they were looking for, or what I, as an investigator, was looking for in each participant. Using the SPSS software, intraclass reliability was conducted in order to measure reliability and homogeneity between the four observers (raters). The final Alpha consists of a decimal number, which demonstrates internal homogeneity between the observers. If the Alpha is <0.50 then the observers have poor internal reliability; if the Alpha is >0.70 , the internal reliability of the observers in the study is excellent (Hinkle, Wiersma, & Jurs, 2003).

Null Hypothesis

The null hypothesis for the present study is that no significant differences will be found between the control group and the experimental group when frequency of elicited happiness codes are analyzed ($H_{01}: u_{hc} = u_{he}$). The alternative hypothesis would be that a difference would be found between the control group and the experimental group when the frequency of elicited happiness codes is compared ($H_{a1}: u_{hc} \neq u_{he}$). A second null hypothesis is that no difference will be found when comparing the control group and the experimental group in their expressions of anger ($H_{02}: u_{ac} = u_{ae}$). A third null hypothesis

states that no difference will be found between experimental and control group in the frequency of elicited disgust ($H_{03}: u_{dc} = u_{de}$). The alternative hypotheses would be that a difference would be found between the experimental and control groups in their frequency of expressions of anger ($H_{a2}: u_{ac} \neq u_{ae}$) and disgust codes ($H_{a3}: u_{dc} \neq u_{de}$).

The null hypotheses were analyzed using the Mann Whitney-U test. All null hypotheses will be rejected at the 0.05 level of significance. The Mann Whitney-U test is a non-parametric test, which was used because of the small number of participants per group, and the different sample sizes in the control and experimental groups.

Demographic characteristics of the participants and results of the tests of hypotheses are presented in the next chapter.

CHAPTER 4

RESULTS

Pilot Study

The pilot study took place with four parental volunteers and their children. Two adults were parents of children with Down Syndrome (DS) and two were parents of typically developing children. Of the children participating in the pilot study, two children had Down Syndrome and two did not. Parents were first asked: "Is the clip just seen acceptable to show children between the ages of 10-15 years old?" All four parents said "yes" for each of the three clips viewed. The second question parents were asked was: "How do you think your child will react?" Regarding the anger-eliciting clip, parents responded with comments such as: "Angry, because they wouldn't want that happening to them or their friends," and "I would be surprised if she didn't get upset or angry with what they did to the little girl." In relation to a clip meant to elicit disgust, parents said: "He will love to see that, but still be grossed out by it," and "He will feel disgusted after watching them eat that." Finally, with respect to the happiness-eliciting clip, parents said: "She will have a good laugh with that show," and "He loves watching people fall over, he'll laugh." The last question posed to the parents was: "Would you allow your child to view this clip?" and unanimously all four parents said yes to the clips to be shown.

When the children watched the clips, they were asked only one question: "How do you feel after watching this clip?" Child 1 said: "That was gross, I wouldn't do that; I was grossed out!" (regarding the clip eliciting disgust). After viewing the clip that elicits anger, he said only, "Sad." When asked further to explain, he said, "Well sad for the girl but angry with the girls that poured paint on her," and finally when shown the happiness-eliciting clip, he said, "It was funny, made me laugh. Was it from *Funniest Home Videos*?" Child 3, when shown the disgust-eliciting clip said, "Ew, yuck, worms, no way yuck." After the anger-eliciting clip he said, "She's covered, funny, she was mad." When the happiness-eliciting clip was shown and he was asked the question, he said, "Funny, falling off boats" (while laughing out loud). Full details of parents' and children's responses can be found in Tables 3 and 4.

As a result of the pilot study, a decision was made to continue to show the same video clips that were used in that study. The clips were selected after the unanimous response from parents and children confirmed that the chosen clips did in fact elicit the targeted emotional response, and that they were age-appropriate.

Participants

The participants in this study consisted of 9 typically developing and 5 Down Syndrome Children. These children are between 10 and 15 years old. The average age of the typically developing children (control) was 10.67 years old ($SD = 1.301$), while the average age of the Down Syndrome children (Experimental) was 13 years old ($SD = 1.871$). There were 10 males and 4 females. A summary of the demographic characteristics of the participants is presented in Table 5.

Table 3

Pilot Study – Parents' Responses

Parents' Questions	Parent	Response to Clips		
		Anger	Disgust	Happiness
<i>Is the clip just viewed acceptable to show children between the ages of 10-15 years old?</i>	1	Yes	Yes	Yes
	2	Yes	Yes	Yes
	3	Yes	Yes	Yes
	4	Yes	Yes	Yes
<i>How do you think your child will react?</i>	1	Angry because they wouldn't want that happening to them or their friends	He will love to see that, but still be grossed out by it	He'll enjoy that
	2	I wouldn't be surprised if she did get upset or angry with what they did to the little girl	She won't like that. She hates worms	She will have a good laugh with that show
	3	He would be angry because this was a malicious plan	He will feel disgusted after watching them eat that	He loves watching people fall over. He'll laugh
	4	Angry at those little girls for planning that	Disgusted I'm sure	I'm positive he will be laughing through the whole thing
<i>Would you allow your child to view this clip?</i>	1	Yes	Yes	Yes
	2	Yes	Yes	Yes
	3	Yes	Yes	Yes
	4	Yes	Yes	Yes

Table 4

Pilot Study – Children's Responses

Response to Clips				
Child's Question	Child	Anger	Disgust	Happiness
<i>How do you feel after watching this clip?</i>	1	Sad.* Well sad for the girl but angry with the girls that poured the paint.	That was gross, I wouldn't do that. I was grossed out.	It was funny, made me laugh. Was it from America's Funniest Home Videos?
	2	I felt bad for the girl, I would be so pissed off if that happened to me.	Disgusted	Embarrassed.* If it happened to me. Watching it made me laugh
	3	She's covered, funny, she was mad.	Eww, yuck, worms, no way, yuck.	Funny, falling off boats
	4	Mmm . . . that's bad. Those girls are bad.	Gross, yeah, the worms	That's so funny

*The child was asked to explain further.

Table 5

Characteristics of Participants

Variable	Control Group		Experimental Group		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	7	78	3	60	10	71
Female	2	22	2	40	4	29
Age						
10	7	78	1	20	8	57
11	1	11	0	0	1	7
12	0	0	0	0	0	0
13	0	0	2	40	2	14
14	0	0	1	20	1	7
15	1	11	1	20	2	14

Investigation

Volunteers were trained to observe specific facial expressions (codes) while watching the videotapes of the participants. Using the SPSS software, inter-rater reliability was estimated in order to measure reliability between the four observers (raters). Inter-rater agreement was 0.719 for anger, 0.824 for disgust, 0.772 for happiness, 0.871 for neutral facial expressions. Total inter-rater agreement is 0.856 which, according Hinkle et al. (2003), is excellent.

The frequencies of the observed codes were tallied for each participant (Table 6), and then analyzed using a non-parametric test –The Mann-Whitney U Test, which was used because of the small number of participants per group, and the different sample sizes in the control and experimental groups. Results, as seen in Table 6, show a

Table 6

Observed Frequencies

Expression Codes	Control Group Frequencies	Experimental Group Frequencies	Z	p
Anger				
Eyebrows pulled together	77	8		
Lowered eyebrows	67	10		
Lips clenched	46	14		
Lips scrunched together	66	10		
Total	256	42	-3.023	0.002
Disgust				
Center of upper lip pulled upwards	44	15		
Raising and stretching nostrils	64	5		
Wrinkle on bridge of nose	69	6		
Total	177	26	-2.071	0.038
Happiness				
Cheek raise	102	64		
Lip corners raised	146	108		
Wrinkles under the eyes	70	15		
Total	318	187	-0.334	0.739
Neutral				
Relaxed mouth (open/closed)	62	27		
No expression shown	4	5		
Total	66	32	-0.138	0.890

significant difference between the control and experimental groups when anger ($Z = -3.023, p = 0.002$) and disgust ($Z = -2.071, p = 0.038$) were elicited. A difference between the control and experimental groups was not found when happiness ($Z = -0.334, p = 0.739$) and neutral ($Z = -0.138, p = 0.890$) code frequencies were analyzed. Thus, the null hypothesis stating that no differences between control and experimental groups in elicited happiness was retained. However, the hypotheses stating that no differences between Down Syndrome and typically developing children in elicited anger and disgust were rejected.

Summary

This study examined if there are differences between Down Syndrome and typically developing children (10-15-year-olds) in anger, disgust and happiness. No differences were found between the two groups in facial expressions of happiness. However, significant differences were found in facial expressions of anger and disgust.

CHAPTER 5

DISCUSSION AND CONCLUSION

Summary

The purpose of this study was to examine if there are differences between Down Syndrome and typically developing 10- to 15-year-old children in their expressions of anger, disgust, and happiness.

Nine typically developing and 5 children with Down Syndrome between the ages of 10 and 15 participated in this study. Three different movie clips were shown to these children. One clip was designed to elicit facial expressions of happiness, another clip was intended to elicit expressions of anger, and another clip was meant to elicit expressions of disgust. Each clip lasted 2-to-3 minutes. Trained observers coded facial expressions of anger, disgust and happiness from the recordings made of the children's expressions while they watched each movie clip.

At the 0.05 level of significance, no difference was found between Down Syndrome and typically developing children in their expression of happiness. However, significant differences were found between the two groups of children in their expression of anger and disgust.

Discussion

In the present study, with respect to the expressions of happiness, a statistical difference between the control and experimental groups was not found. Similar results were presented by Carvajal and Iglesias (2000) and Smith and Dodson (1996). Carvajal and Iglesias (2000) found that children with Down Syndrome smiled as much at their mother's face as children who were typically developing. The participants ranged in age from 3.2 months to 13.6 months of age, and the results were equal for all age groups. Smith and Dodson (1996) examined adults with Down Syndrome and found no significant differences in smiles between the experimental and control groups. The present study was more comparable to the latter study than it was to the study conducted by Carvajal and Iglesias (2000), because the elicitation task was different in their study. The infants played with their mothers in their home environment and were videotaped, whereas the participants in the study by Smith and Dodson (1996), as well as the present study, viewed videotapes to elicit facial expressions and were videotaped while watching the clips.

The present study also found that the experimental and control groups differed significantly when expressions of disgust and anger were elicited. Cicchetti and Sroufe (1978) found similar results as those significant differences found in the present study between children with Down Syndrome and typically developing children. Their study discovered a difference in infants ages 12 and 16 months old when negative expressions such as crying were elicited (disgust and anger can be placed into the same category as negative expressions). They found that less crying was displayed by infants with Down Syndrome as compared to typically developing infants. The tasks that took place in order

to elicit these negative expressions were dissimilar, as were the participants' ages, but the results were similar.

Thus, the present study reflects the results of earlier studies, including those with participants of different age groups. However, not all previously conducted studies have found similar findings to those in the present study. Kasari et al.'s (1990) results did not show a significant difference between the control and experimental groups when negative expressions were evaluated. They also found that the experimental group (infants with Down Syndrome) showed more neutral and positive expressions in comparison to the control group (typically developing children). Previous findings by Smith and Dodson (1996) were similar to the present study's findings when positive expressions were compared, but their results also showed no significant differences between the groups when sad clips were shown, which means that the experimental and control groups did not differ in the expressions exhibited during the sad clips. As mentioned earlier, the Smith and Dodson (1996) study was the most comparable to the present study, with respect to the procedure, but not the age of the participants. Unfortunately, there is not enough evidence to say for certain that as participants get older, fewer differences are found between groups, or the older participants become, the more differences there are between control and experimental groups. An explanation for the contradictory findings, other than the age of the participants, can be found in recognition studies.

Studies of expression recognition have shown that individuals who have not had experience working with or interacting with individuals with mental retardation are least likely to correctly identify their facial expressions, whereas teachers of children with mental retardation are significantly correct at identifying their facial expressions, more

than individuals without experience with MR and more than parents of children with MR (Maurer & Newbrough, 1987). This is even more of a reason for researchers, teachers, parents, and all individuals to become familiar with facial expressions of persons with Down Syndrome and other disorders that affect verbal communication.

In the present study, limitations were found in the groupings of the participants. I was not able to pair the control group and experimental group according to their mental age. Mental or cognitive age is important because the chronological age may possibly not match their mental age due to the delays caused by a disorder such as Down Syndrome. By matching the participants on their mental age, researchers would be certain that both experimental and control groups would understand the video clips in a similar manner. For example, Xeromeritou (1992) matched her participants based on their MA. Her study entailed a story in which an emotion was mentioned and felt by the character. Participants were then to point to a picture that exhibited the emotion in the story, or were to verbalize the emotion that was felt by the character in the story. Results showed no differences between the groups of children with MR and without MR. The level of understanding of the story by each participant in this investigation was not an influential factor when the results were analyzed, due to the fact that the participants were matched on their MA.

A further limitation in this study was the small sample size for both the experimental and the control groups. A larger sample size would have allowed results to be extrapolated to a larger population, but due to the small number of participants, the results of this study must be viewed cautiously. For future investigations, it is suggested

that a larger sample be used, and information on participants' mental age be first gathered through parental disclosure.

The young age of the children limited the variety of video clips that could be used. This may have influenced the expressions elicited. Longer clips, and clips that elicit specific expressions more intensely, may have produced different results, particularly when anger and disgust were targeted. Finding age-appropriate clips that not only elicit targeted emotions, but also are also simple enough for all subjects to understand is an important factor, which may have limited or affected the results found in this investigation. My suggestions for future studies would be to focus on finding appropriate, simple-to-understand video clips with enough intense content to elicit the targeted emotions.

The understanding by all individuals of different types of communication is of importance; the findings in this study specifically have sustained previous findings, and have explored an age range not previously researched.

More research needs to be conducted with teenage participants to clarify disparate results from existing studies, which seem to have found both similarities and differences among the same age range of participants. The teenage years are important to study because investigations have found that as individuals with Down Syndrome get older, the less they are able to recognize expressions on another person's face and the less able they are to interpret meaning. Thus, researchers want to make sure that as individuals with DS get older, more research is done to find out whether or not they lose their abilities to communicate through their expressions. Researchers can observe the development of teens with DS, and could possibly detect deterioration, if that is what some individuals

demonstrate. Since individuals with DS now have a longer life expectancy, researchers, parents, and teachers should be interested to know what occurs as they mature, especially in terms of communication. More research with this age group may also exonerate age as an influential factor in the diverse results obtained by the previous studies that were reviewed.

The larger issue that emerges from this and previous investigations is inclusion: Society must endeavor to understand each individual, and provide the opportunity to communicate needs to improve quality of life. The more teachers, parents, and others are open to the opportunities to learn more about nonverbal communication, such as facial expressions, the better able we are to enrich our own lives, as well as those who need to be understood the most. Down Syndrome is not the only disorder that prevents individuals from communicating with others as a typically developing individual would. Thus, it is important to be attuned to each individual's communication level, including their non-verbal abilities.

Teachers for example, are to benefit from more investigations for the reason that their classrooms are filled with complex children. They are all different in temperament, intelligence, abilities, and challenges. On top of that teachers must now face the challenge of including special needs children into their classroom, of whom each of them have their own different temperament, intelligence, abilities, and challenges. The more a teacher is able to become educated about the differences their students with special needs possess, the better able they will be to provide the necessary teaching tools, the necessary attention, and the necessary inclusion. The teacher would benefit from this as well because the better able they are to comprehend the differences in their students with

special needs, the better able they will be at organizing their classroom, becoming aware of each student as an individual, and avoiding problems that may arise due to the differences found between the typically developing students and the students with special needs.

As seen from the findings in the present study, children with Down Syndrome differ from typically developing children in the way they express themselves through facial expressions. A teacher who is sensitive to this information would be alert at the child's expressions throughout the day, and thus would know when the child is having trouble with their work, is being disturbed by other students, or is having a hard time understanding the lesson. This teacher would know that this specific child does not react in the same way as the typically developing students in her class. Drawing attention to the fact that differences have been found in non-verbal communication, such as facial expressions between typically developing children and children with Down Syndrome is a warning to individuals who work with persons with special needs that more research needs to be conducted and that the knowledge obtained from research should be shared, because it could only benefit those individuals with special needs and benefit the people that work with them or spend time with them.

Conclusion

The results of the present study did not eliminate dissimilar conclusions from previous investigations, but did increase and further the research conducted on facial expressions of individuals with Down Syndrome. More needs to be learned and shared with those closest to individuals who communicate through nonverbal means, such as facial expressions. Significant improvement of lives can be the result of further research.

APPENDIX: LETTERS

**Andrews University
Department of Education**

Comparison of elicited facial expressions in children with and without Down syndrome
Orietta Coz, Master's student in the Dept. of Education
R. Bailey, Advisor

Dear Parent(s)/Guardian(s),

I am conducting a study in which I will be examining facial expressions of children with and without Down syndrome. The technique that I will use involves showing children video clips and recording their facial expressions.

I have chosen to examine this aspect of nonverbal communication hoping that this research will assist parents, teachers, and other individuals in better understanding the nonverbal reactions of children who have Down syndrome. In order to do so, I have to examine the facial expressions of children without Down syndrome. As a result, caregivers and educators will hopefully be less likely to misunderstand the information that children may be trying to convey to us through nonverbal expressions. It is important to note that children do not always communicate using words, or written language. Facial expressions share information just as well as written or spoken language, and thus are equally important.

If you decide to allow your child to participate in this study, he or she will be involved in the following process: A room will be set up in Andrews University Counseling Center for children to watch a set of video clips. Parent(s)/guardian(s) will be able to sit in the waiting room just outside the room in which the study will take place. The study will take 20 minutes, in which children will be shown video clips. Their nonverbal reactions (e.g. facial expressions) will be video taped. The study has been carefully designed not to cause stress or discomfort to the participants, however, in case of potential stress or discomfort from the video clips viewed, assistance will be provided to the participants by a school psychologist.

Your child's name or video recordings will not be associated with the results. The investigator will be the only person to access individual data and the identity of participants will be kept confidential. Data reported in theses or other publications will not make reference to your child's name or any other identifying details.

Participation in this study is voluntary and refusal to participate will not be penalized. Your child also has the right to terminate his or her involvement in this study at any time without being penalized. No form of compensation for participation will be given. However, participation in this study will help us to better understand the importance of nonverbal forms of communication. Parent(s)/guardian(s) will have the opportunity to view video clips and ask questions regarding this study before giving consent. The investigator in this study will at all times abide by the ethical and moral policies of Andrews University and the field of educational psychology.

**Andrews University
Department of Education**

*Comparison of elicited facial expressions in children with and without Down syndrome
Orietta Coz, Master's student in the Dept. of Education
R. Bailey, Advisor*

Dear Parent(s)/Guardian(s),

I am conducting a study in which I will be examining facial expressions of children with and without Down syndrome. The technique that I will use involves showing children video clips and recording their facial expressions.

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If you decide to allow your child to participate in this study, he or she will be involved in the following process: A room will be set up in Andrews University Counseling Center for children to watch a set of video clips (If this location is too far, the investigator will set up a closer locale). Parent(s)/guardian(s) will be able to sit in the waiting room just outside the room in which the study will take place. The study will take 20 minutes, in which children will be shown video clips. Their nonverbal reactions (e.g. facial expressions) will be video taped. The study has been carefully designed not to cause stress or discomfort to the participants, however, in case of potential stress or discomfort from the video clips viewed, assistance will be provided to the participants by a school psychologist.

Your child's name or video recordings will not be associated with the results. The investigator will be the only person to access individual data and the identity of participants will be kept confidential. Data reported in theses or other publications will not make reference to your child's name or any other identifying details.

Participation in this study is voluntary and refusal to participate will not be penalized. Your child also has the right to terminate his or her involvement in this study at any time without being penalized. No form of compensation for participation will be given. However, participation in this study will help us to better understand the importance of nonverbal forms of communication. Parent(s)/guardian(s) will have the opportunity to view video clips and ask questions regarding this study before giving consent. The investigator in this study will at all times abide by the ethical and moral policies of Andrews University and the field of educational psychology.

Thank you for taking the time to read this and if you are interested please contact me:

Orietta Coz
Andrews University
cozom@hotmail.com
coz@andrews.edu

**Andrews University
Department of Education
Informed Consent**

Comparison of elicited facial expressions in children with and without Down syndrome

Orietta Coz, Master's student in the Educational Dept.

R. Bailey, Advisor

I, _____, agree to let my child, _____, voluntarily participate in a research project being conducted by Orietta Coz, Master's student in the Department of Education, under the supervision of R. Bailey, advisor.

I understand that the purpose of this study is to improve the research in the area of nonverbal communication of children. The findings of the study will be beneficial to parents, teachers, and other individuals that work with children and more specifically, children with Down syndrome.

By allowing my child to participate in this study, I understand that I am responsible for transporting my child to the Andrews University Counseling Center. Andrews University will not be liable during transportation. I understand that the research project will last for a maximum of 20 minutes during after school hours. I understand that they will be exposed to video clips. I understand that my child's nonverbal reactions will be videotaped and that my child's identity will be kept confidential and full anonymity will be preserved in the research project write-up. I understand that expressions being videotaped will be coded for type of expression and the analysis will be based on these codes.

I understand that the study is designed to not cause stress or discomfort to my child, however, in case of a potential discomfort or stress from the video clips viewed, assistance will be provided to the participants if needed, by a school psychologist. I have been told of the benefits this study will have in the area of nonverbal communication.

My signature acknowledges my consent to allow my child to participate in this research project. My child's participation does not release the investigator from their ethical responsibilities to me and my child.

I understand that participation in this study is voluntary and my refusal or my child's refusal to participate will not be penalized. I understand that there will be no form of payment to induce my child to participate.

I am giving the investigator of this study, authorization to use and dispose of the findings from this research in any way the investigator needs with the understanding that my child's name and video recordings of my child will not be used in association with the results. I understand that the data will be used in a research thesis by Orietta Coz, a Master's student.

I understand that I will have the opportunity to view the video clips and ask questions regarding the study, before I give consent for my child to participate in this study.

I understand that my confidentiality and my child's confidentiality will be protected. The investigator will be the only individual viewing the video clips and the videos will be stored in a safe and secure location while in use.

I understand that my child has the right to terminate their involvement in this study at any time without being penalized.

I have read and I understand the contents of this form and have received a copy. I understand that if I need more information of this research project, I can contact the following individuals:

Orietta Coz
35 Jonagold Crt
Richmond Hill, Ont
L4S1Y4 Canada
647-222-9174
coz@andrews.edu

Rudolph Bailey
Andrews University
269-471-3346
rbailey@andrews.edu

Signature of Parent/Guardian

Date

Signature of Child

Date

Witness

Date

REFERENCE LIST

REFERENCE LIST

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