

1-1-2011

# Enhancing the Ability of Adults with Mild Mental Retardation to Recognize Facial Expression of Emotions

Juna Michel  
*Walden University*

Follow this and additional works at: <https://scholarworks.waldenu.edu/dissertations>

 Part of the [Cognitive Psychology Commons](#)

---

This Dissertation is brought to you for free and open access by the Walden Dissertations and Doctoral Studies Collection at ScholarWorks. It has been accepted for inclusion in Walden Dissertations and Doctoral Studies by an authorized administrator of ScholarWorks. For more information, please contact [ScholarWorks@waldenu.edu](mailto:ScholarWorks@waldenu.edu).

# Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Juna Michel

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

## Review Committee

Dr. Elizabeth Matthews, Committee Chairperson, Psychology Faculty  
Dr. Patricia Heisser Metoyer, Committee Member, Psychology Faculty  
Dr. Patricia Costello, University Reviewer, Psychology Faculty

Chief Academic Officer  
Eric Riedel, Ph.D.

Walden University  
2013

Abstract

Enhancing the Ability of Adults with Mild Mental Retardation to Recognize Facial  
Expression of Emotions

by

Juna Michel

MA, Pace University, 2001

BA, York College, 1999

Dissertation Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy  
Clinical Psychology

Walden University

September 2013

## Abstract

A critical element in the development of interpersonal skills is the ability to recognize facial expressions. However, in persons with mild mental retardation (PMR), social interactions based on the recognition of others' emotional states may be compromised. Guided by the theory of mind, which allows one to make inferences on someone's mental states, differentiate facts from fiction, and process others' beliefs and intentions, this study determined if emotion training impacted future emotion recognition scores in a PMR population and whether the variables of gender, age, and baseline Facial Expression of Emotions Stimuli and Test (FEEST) scores predicted changes in emotion recognition. Secondary data from a group of trainees identified as having mild mental retardation who participated in an emotion recognition training program ( $n = 31$ ) were assessed. A paired samples  $t$  test revealed no differences between the pre- and post-assessments as a function of training, and the multiple regression analysis revealed that gender, age, and baseline FEEST score did not predict changes in emotional recognition. These findings, despite their nonsignificance, offer a unique contribution to the field of mental retardation and contribute to theory of mind research in PMR populations. Positive social change implications include the potential ability to identify ways to improve social skills and effective training models to foster social inclusion in PMR population.



Enhancing the Ability of Adults with Mild Mental Retardation to Recognize Facial

Expression of Emotions

by

Juna Michel

MA, Pace University, 2001

BA, York College, 1999

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

September 2013

UMI Number: 3597454

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI 3597454

Published by ProQuest LLC (2013). Copyright in the Dissertation held by the Author.

Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against unauthorized copying under Title 17, United States Code



ProQuest LLC.  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106 - 1346

## Acknowledgments

I would like to thank Dr. Elizabeth Matthews for being supportive in getting me this far in my journey. You have been very kind and patient with anything put before you, motivational, and willingness to all you could. You have been a wonderful teacher. During the IRB process, you have helped me with words of encouragement. In addition, I would like to thank Dr. Patricia Heisser Metoyer. You have been helpful with suggestions on statistics and research, as well as being prompt. I am very fortunate to have both members on my committee.

I wish to thank my dissertation coach, Jill Blackwell as my back up proofreader. You have been helpful with suggestions on statistics and research, as well as being prompt. Thank you for all your help and dedication to my dissertation.

Finally yet importantly to my family and friends who supported me going through many years of school. I am grateful to my parents who let me stay with them during my final stage of the dissertation and kept me company while typing every night.

## Table of Contents

List of Tables .....	iv
List of Figures .....	v
Chapter 1: Introduction to the Study.....	1
Introduction.....	1
Problem Statement .....	2
Purpose of the Study .....	3
Research Question and Hypotheses .....	4
Research Question .....	4
Hypotheses.....	4
Theoretical Framework .....	5
Definition of Terms.....	6
Assumptions, Limitations, and Delimitations.....	10
Significance of the Study .....	11
Summary and Transition.....	13
Chapter 2: Literature Review.....	14
Introduction.....	14
Literature Search Strategy.....	14
Historical Context of Mental Retardation and Social Skills.....	15
Deficit Theory.....	16
Deficits in Cognitive Skills.....	16
Deficits in Emotion Recognition .....	18
Neuroanatomy of Emotion.....	21

Neuroanatomical Structures of Emotion Recognition .....	22
The Importance of Facial Expressions.....	24
The Recognition of Facial Emotion.....	24
Facial Expressions and Adaptive Functions .....	28
Facial Expression Research in the Intellectually Disabled .....	31
Research on Training in Emotion Recognition.....	34
Social Change .....	35
Summary.....	35
Chapter 3: Research Method.....	37
Introduction.....	37
Research Approach, Design, and Variables.....	38
Research Approach.....	38
Research Design.....	38
Variables .....	39
Research Questions and Hypotheses .....	39
Research Question .....	39
Hypotheses.....	39
Participants.....	40
Study Materials .....	41
Emotion Recognition Assessment Instrument .....	41
Emotion Recognition Training Program Protocol .....	42
Data Collection Procedures.....	42
Data Analysis Procedure.....	43

Ethical Protection of Participants.....	44
Summary .....	44
Chapter 4: Results.....	46
Introduction.....	46
Research Questions and Hypotheses .....	46
Research Question .....	46
Hypotheses.....	47
Descriptive Analyses .....	48
Inferential Statistics .....	48
Additional Analysis .....	51
Summary.....	52
Chapter 5: Discussion, Implications, and Recommendations.....	53
Introduction.....	53
Interpretations of Findings.....	53
Limitations of the Study.....	57
Recommendations for Actions.....	58
Recommendations for Future Research .....	59
Implications for Social Change.....	60
Conclusion .....	61
References.....	62
Appendix A: Training Program Protocol.....	77
Appendix B: HIPPA Compliant PHI Release Form .....	79
CURRICULUM VITAE.....	81

## List of Tables

Table 1. Trainee Ages.....	51
Table 2. Analysis of Variance.....	52
Table 3. Summary of Multiple Regression Analysis.....	53

List of Figures

Figure 1. Scatterplot.....54

## Chapter 1: Introduction to the Study

### **Introduction**

The recognition of emotion and the ability to understand, express, and recognize facial expressions are important factors in social interaction (Ekman, Friesen, & Ellsworth, 1972; Izard, 1971). These factors are essential to the development of interpersonal skills that allow individuals to develop healthy social relationships and coping mechanisms to deal with stressors as well as avoid interpersonal problems (Guralnick, 1986). As facial expressions of emotions are important signals for social communication, an inability to identify such signals may impede an individual's social functioning and quality of life. Some researchers reported that persons with mild mental retardation (PMR) often have difficulty identifying the facial emotions in others, and as a result they tend to develop deficits in interpersonal skills (Gray, Fraser, & Leuder, 1983; McAlpine, Kendall, & Singh, 1991).

Although many researchers have investigated the manner by which adults decode facial expressions, few have examined the effects of training in the recognition of facial expressions of emotion in a PMR population, and even fewer have assessed whether individuals with mild mental retardation can benefit from such training (Bozikas, Kosmidis, Anezoulaki, Giannakou, & Karavatos, 2004; Carton, Kessler, & Pape, 1999; Mah, Arnold, & Grafman, 2004). The purpose of the current investigation was to fill this research gap by investigating whether training in decoding facial expressions increases recognition of facial expressions of emotions in adults with mild mental retardation.

### **Problem Statement**

The ability to recognize emotions is important, and researchers have maintained that appropriate social interaction requires the ability to recognize facial expressions of the six basic emotions of happiness, sadness, surprise, anger, fear, and disgust (Boucher & Carlson, 1980; Ekman & Friesen, 1971). Decoding appropriate emotions from the face is essential for social interaction, especially for individuals with mental retardation, because it provides individuals with the tools necessary to express and communicate emotion (Ekman et al., 1972). Individuals with intellectual disabilities have been shown to be limited in their ability to decode emotions, and as a result, some researchers maintained that this contributes to deficits in social interaction (Wing & Gould, 1979). Despite this problem, only a few researchers have examined the ability of PMR to benefit from training in the recognition of facial expressions of emotion (Gray et al., 1983; McAlpine et al., 1991), and additional research needs to be conducted in a PMR population.

The accurate assessment of emotion recognition is important, as the results of an assessment can assist clinicians in identifying deficits so appropriate training interventions can be implemented. Bielecki and Swender (2004) demonstrated that emotion cognition training improved the lives of PMR and contributed to successful community integration; however, additional research needs to be conducted on emotion recognition training with this population. The results of the current study fill this research gap and provide information on the efficacy of emotion training on emotion

recognition, and this information may be used by clinicians to create appropriate strategies to augment facial emotion recognition skills.

### **Purpose of the Study**

The purpose of the current investigation was to determine the effect of a training program on the recognition of facial expression on future emotion recognition in a PMR population and to determine if gender, age, or baseline emotion recognition impact recognition skills. Another purpose of the investigation was to validate the use of the FEEST in a PMR population. Although the FEEST has been used extensively with individuals without mental retardation, and it is approved for use in a PMR population, the application of this assessment tool in a PMR population has not yet been empirically investigated. Results from the current study will add to the literature on the FEEST.

The ability to understand, express, and recognize facial expressions is an important factor in social interaction. Researchers have found that PMR often have difficulty recognizing the emotions of sadness, fear, disgust, anger, and surprise (Gray et al., 1983; Maurer & Newbrough, 1987; McAlpine et al., 1991). Emotion recognition training may assist individuals who are deficient in recognizing emotions; however, there is a paucity of research on this topic. Although researchers identified a need for such training for individuals both with and without mental retardation (Leather & Emigh, 1980; Muzekari & Bates, 1977; Vosk, Forehand, & Figueroa, 1993), none have investigated the impact of emotion recognition training on emotion recognition outcomes in a PMR population.

## Research Question and Hypotheses

### Research Question

Does training of facial expression characteristics increase future emotion recognition scores in a PMR population? Are gender, age, or FEEST assessment I scores related to the difference between FEEST assessment I and FEEST assessment II scores?

### Hypotheses

**H1<sub>o</sub>**. There will be no significant difference between FEEST assessment I and FEEST assessment II scores.

**H1<sub>a</sub>**. There will be a significant difference between FEEST assessment I and FEEST assessment II scores.

**H2<sub>o</sub>**. Gender will not predict the difference between FEEST assessment I and FEEST assessment II.

**H2<sub>a</sub>**. Gender will predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>o</sub>**. Age will not predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>a</sub>**. Age will predict the difference between FEEST assessment I and FEEST assessment II.

**H4<sub>o</sub>**. Baseline FEEST score will not predict the difference between FEEST assessment I (PRETEST) and FEEST assessment II (POSTTEST)

**H4<sub>a</sub>**. Baseline FEEST score will predict the difference between FEEST assessment I and FEEST assessment II.

## Theoretical Framework

The theoretical framework of the current investigation relates to *theory of mind*. The theory of mind as defined by Wellman (1993) allows one to make inferences on someone's mental states, differentiate facts from fiction, and process others' beliefs and intentions. In a PMR population, social interactions based on the recognition of others' emotional states may be compromised because of impairment in recognizing emotions from facial expressions. The cognitive aspects of the theory of mind are thought to structurally exist in the temporoparietal areas, the medial prefrontal cortex, and the temporal poles (Frith&Frith, 2003; Vogeley et al., 2001; Vogeley& Fink, 2003). The maturity of the theory of mind is based on metacognitive and metavolitional development. For that reason, it has not been related to intelligence (Baron-Cohen, 2001).

Individuals with mental retardation have deficits in performance of theory of mind compared to those without developmental disabilities (Yirmiyis, Erel, Shakel, & Levi, 1998). Still, individuals with mental retardation are shown to develop theory of mind better than individuals with autism with normal intelligence, and they perform tasks fairly well compared to individuals without any developmental disability (Happe, 1994); however, information is needed on how PMR populations can recognize emotions from facial expressions, and if strategies to enhance recognition are effective.

The ability to understand, express, and recognize facial expressions is an important factor in social interaction. Researchers have found that PMR often have difficulty recognizing the emotions of sadness, fear, disgust, anger, and surprise (Gray et al., 1983; Maurer & Newbrough, 1987; McAlpine et al., 1991). Emotion recognition

training may assist individuals who are deficient in recognizing emotions, and researchers identified a need for such training for individuals both with and without mental retardation (Leather & Emigh, 1980; Muzekari & Bates, 1977; Vosk, Forehand, & Figueroa, 1993). The current investigation will contribute to theory of mind research by adding information on the impact of emotion recognition training on emotion recognition outcomes in a PMR population.

### **Definition of Terms**

*Adaptive behavior:* An individual's degree of effectiveness in performance based on standards of personal and social responsibility stipulated by cultural norms (Grossman, 1973). The American Association on Intellectual and Developmental Disabilities (AAIDD) has developed adaptive behavior scales measuring communication, community, functional-academic, home-school living, health and safety, leisure, self-care, self-direction, social, and work skills (American Association of Mental Retardation [AAMR], 2002).

*Acquisition deficit:* An acquisition deficit refers to the absence of knowledge in performing a given skill (e.g., is not in the individual's behavior repertoire). Acquisition deficits consist of social skill deficits and self control skill deficits.

*Developmental disability:* Developmental disability is a form of disability such as mental retardation and others disorders such as cerebral palsy, seizure disorder, neurological impairment or autism. This disability manifests prior to age 22 and it can be expected to last indefinitely. The disability can impede their ability to live a normal life.

*Electroencephalography:* Electroencephalography is the measurement of the electrical activity produced by the firing of neurons within the brain.

*Emotion:* Emotion is defined as a series of reactions and actions exchanged between individuals in a continuous process in which each emotional state has its own meaning. Each individual perceives each emotion differently. When things are not going the way we want them to, we develop anxiety, fear, sadness, guilt, shame, envy, or jealousy, but when things go right, we experience joy, pride, or love (Lazarus, 2006). As important aspects of relationships, emotions can strengthen or destroy interpersonal relationships.

*Fluency deficit:* A fluency deficit refers to the frequency of skills performance (Glumpel et al., 1996). Individuals with mental retardation have poor social competence and deficits in adaptive behavior and social skills. Deficits in social skills may contribute to poor adjustment after school (Chadsey-Rushch, Rusch, & O'Reilly, 1991; Edgar, 1988). Lack of social competence has been cited as a major reason for job separation with this population (Greenspan & Shoultz, 1981). Adults with mental retardation are deficient in areas of social skills and problem-solving skills.

*Functional magnetic resonance imaging (fMRI):* fMRI is a type of specialized magnetic resonance imaging scan that measures blood flow in the brain.

*Mental retardation:* Mental retardation is defined as a below average ability in the areas of intellectual, social, and adaptive skills. These deficits must occur prior to age 18. The AAMR classifies individuals with an IQ of 70 or below as having mental retardation and divides mental retardation into the subcategories of mild, moderate,

profound, and severe. Approximately 85% of PMR fall within the mild range of mental retardation and some individuals with severe forms of intellectual disability suffer from various physical disabilities (Dillon & Carr, 2007). Impairments can manifest in intellectual and adaptive functioning (American Psychological Association [APA], 2000). Ellis (1969) defined mental retardation as one or more deficits in cognitive and adaptive functioning which is encompassed within the AAMR and APA criteria for mental retardation. De Bildt et al. (2005) further specified, “Adults with mental retardation are deficient in basic skills such as understanding the social context of a situation, understanding a joke, taking the other person’s perspective, and understanding that a friendly person actually is doing no harm” (p. 318).

*Mild mental retardation:* Mild mental retardation is determined when the individual obtains a score of 50-55 on the Wechsler Adult Intelligence Scale or 52-68 on the Stanford Binet. Individuals with Mild Mental Retardation can acquire both practical and academic skills, as well as both social and adaptive skills to live independently with some assistance.

*Moderate mental retardation:* Moderate mental retardation is classified as an IQ of 35-40. An individual with the score of 35-40 will fall within the Moderate Range of Mental Retardation. As adults these individuals can complete most self care tasks and participate in recreational programming.

*Severe mental retardation:* Severe mental retardation is classified as an IQ of 20-25. An individual with an IQ of 20- 25 will be diagnosed with Severe Mental

Retardation. As adults, they can perform daily routines, repetitive activities, and self-care under supervision.

*Profound mental retardation:* Profound mental retardation is classified as an IQ of below 20. A score of below 20 is within the range of profound mental retardation. Individuals with Profound Mental Retardation can achieve some level of communication and self-care skills. They need assistance in most areas of activity of daily living skills (APA, et al., 2000).

*Perception:* Perception is an individual's ability to process visual information and its configuration (Adolphs, 2002). Perception depends on the visual structure of the stimulus and recognition that require knowledge from introspection of the visual stimuli.

*Performance deficit:* A performance deficit occurs when an individual knows how to perform the behavior, but has difficulty doing so at an acceptable level. Performance deficits can be related to lack of motivation or to the absence of an occasion to perform the behavior. For example, an individual with performance deficit has social performance deficit and self-control performance deficit. Performance deficits can be conceptualized as a concurrent reinforcement schedule (Glumpel & Wilson, 1996).

*Positron emission tomography (PET):* PET is a device used to measure the blood flow in the brain. This machine creates a three dimensional image of the brain.

*Recognition:* Recognition as it relates to emotion is the ability to perceive others' mood and the ability to identify specific emotions (Carton, Kessler, & Pape, 1999). Recognition requires some types of memory and basic knowledge of the world. Adolphs et al. (2002) posited that because human face recognition requires the recognition of

individual identity through perception of the face and its emotional expressions, it requires the individual to remember information regarding an individual's face and what the individual felt in response to observing the face. Recognition has much to do with memory. Perception occurring after the onset of the stimulus takes place on the sensory cortices (Adolphs et al., 2002).

*Social skills deficit:* Social skills deficits were defined by Bellack (1983) as observable and measurable interpersonal behaviors that promote independence, social acceptability, and quality of life. Individuals with developmental disabilities, including those with mental retardation, tend to have social skill deficits. Gresham (2002) classified social skill deficits into the three categories of (a) performance deficits, (b) acquisition deficits, and (c) fluency deficits. Whereas individuals with performance deficits acquire social skills but do not perform them, individuals with acquisition deficits never acquire social skills.

### **Assumptions, Limitations, and Delimitations**

There are several assumptions, limitations, and delimitations of the study. It was assumed that the trainees in the training program have mild mental retardation, operationally defined as a full scale IQ of 52 to 68. Although information on IQ was not obtained from the trainees, individuals who were registered with the Association for the Help of Retarded Children (AHRC) Day Program at the Joseph T. Weingold Center in Queens New York typically have IQ scores between 52 and 68.

A limitation of the study was that the results may not be able to be applied to individuals with the same disability who were not enrolled in sheltered workshops and

supportive work programs. As this study was limited to adults with mild mental retardation who were enrolled in sheltered workshops and supportive work programs for adults with mental retardation, it is unclear if the results will generalize to mentally retarded individuals who do not participate in these types of programs.

Although a true experiment with a treatment and control group would provide information about cause and effect, the current intervention response study can only provide information about the differences in score before and after a training program.

### **Significance of the Study**

Adults with mild mental retardation often have deficits in interpersonal skills and the skills necessary to identify specific emotions and moods, and the ability to identify objects by categories is essential for human adaptive functioning (Campion et al., 1984). The ability to identify emotions from someone's facial expressions is fundamental in human social interactions and functioning (Engelberg & Sjober, 2004). Adults with mild mental retardation have difficulty decoding facial expressions, and as a result they may experience deficits in social adjustment and adaptation. The impact of training of emotional recognition in a PMR population has not yet been investigated. Greater assessment of emotion recognition is needed because identification of deficits may lead to appropriate training for individuals with mental retardation. Results from this study may assist other professionals working with individuals with mental retardation by giving them the tools necessary to improve their clients' recognition of emotions. A better understanding of mental retardation and poor interpersonal skills could enable mental health practitioners with the effective tools necessary to better treat them. Kavales and

Forness (1996) noted that the majority of individuals with intellectual disability are lacking in the areas of social skills as opposed to those without intellectual disability, and deficits in emotion recognition may be influential in this relationship. The results of this study may contribute to social change agents, and it can assist other professionals in creating appropriate training tools to improve the recognition of emotions. This in turn may increase positive social and adaptive interactions of individuals with mild mental retardation. Positive social change implications for the individual include increased awareness of emotion recognition deficit in PMR populations so that appropriate training models can be implemented to promote accurate identification of emotions, along with positive social interaction with peers and staff.

McAlpine et al. (1991) maintained that underdeveloped emotion recognition skills may lead to inappropriate social interactions and can contribute to social rejection or social isolation. Belack et al. (1993) noted that if social skills are not developed, individuals with mental retardation may develop other maladaptive behaviors such as avoidance behavior, avoiding interpersonal contact, which can create adaptive problems such as isolation, inability to hold jobs, and lack of understanding of how to behave in social situations. It is important to determine the impact of facial emotion training on future emotion recognition, as the consequences of lack of recognition are so detrimental. The results of the current investigation will also contribute to needed information related to the theory of mind in a PMR population.

### **Summary and Transition**

The purpose of the current investigation was to determine the efficacy of facial expression training on future emotion recognition in adults with mild mental retardation. The results from this study will expand the knowledge base regarding the recognition of facial expressions of emotion in individuals diagnosed with mild mental retardation. It has been shown that adults with mild mental retardation are deficient in emotion recognition (Engelberg et al., 2004); however no research has been conducted to evaluate strategies to alleviate this problem. Teaching adults with mild mental retardation to recognize facial expressions of emotion may improve their emotion recognition skills. This chapter provided the background and problem and purpose statements for the proposed investigation. Definitions of the key terms were introduced, and the proposed research question and hypotheses were identified. Chapter 2 provides a review of the literature pertaining to mental retardation, emotion, perception, recognition, and interpersonal skills. Chapter 3 describes the study methodology. Chapter 4 provides information about the results of the data analysis. Chapter 5 concludes this research by providing a summary of the findings and a discussion of social change implications and providing recommendations for future research.

## Chapter 2: Literature Review

### **Introduction**

Emotional expressions of happiness, sadness, surprise, fear, anger, and disgust can be identified from facial expressions by individuals across all cultures. Some researchers maintained that adaptive social communication skills rely on facial expressions. In order for individuals to communicate effectively, they must have the skills needed to decode facial expressions. Moore (2001) found that Persons with Mental Retardation (PMR) were deficient in recognizing other people's emotions; however, it is currently unclear whether this deficit impacts the social communication skills of PMR, and it is also unclear if strategies to augment emotion recognition skills in a PMR population are facilitative. Continued research is needed in the areas of emotion recognition among PMR, and the results from the current investigation add to the literature on this important topic. The purpose of the current investigation was to determine the effect of a training program in the recognition of facial expression on future emotion recognition in a PMR population and to determine if gender, age, and baseline emotion recognition impact recognition skills.

### **Literature Search Strategy**

Peer-reviewed articles were identified through a search of several databases, including PsychINFO, PsycARTICLES, Sage, and the Walden University database. Numerous keywords were searched, including *emotion*, *mental retardation*, *social skills*, *facial expression*, *expression decoding*, *face perception*, *enhance*, *training*, and *emotion*

*recognition*. The current research on the recognition of facial expression of emotions in adults with mild mental retardation is reviewed in this chapter.

### **Historical Context of Mental Retardation and Social Skills**

Previously, PMR were cared for in large institutions. Many of these institutions were segregated, isolated, and overcrowded, and individuals residing in these types of settings were often neglected and abused (Blatt-Kaplan, 1966). The Kennedy administration and advocates implemented many changes in the 1960s. Legislation was passed to increase community-based services, including a network of university affiliated treatment and research centers known today as University Centers of Excellence in Developmental Disabilities and the Mental Retardation/ Developmental Disability Research Centers (Dykens, 2006). The first Presidential Commission on Mental Retardation was created in 1961 and continues today. The term *normalization* was embraced by parents and advocates. They created policies that promoted the inclusion of PMR into the community (Dykens, 2006).

The term *social deficit* refers to one of the characteristics among PMR. These individuals were classified as lacking the ability to function normally and to achieve normal integration in society. *Normalization* was defined as “the enhancement of positive adaptive behaviors rather than the treatment of maladaptive or antisocial behavior” (Simpson, 1996, p. 103). Normalization was based on the idea that all PMR would gain access to mainstream services, and on the humanist theory focusing on the human rights of PMR (Simpson et al., 1996). Social inclusion was an area of concern in both intrapersonal factors and societal contexts for this population. A sense of belonging was

considered essential to personal integration, and it was important that individuals with disabilities be part of the community (Bulmer, 1987).

Prior to the 20th century, there were no services for people diagnosed with developmental disabilities, especially mental retardation. Most individuals who were disabled lived at home with their families (Oliver, 1990). In the late 19th and early 20th centuries, the institutional model evolved. Institutions provided basic custodial care. The clients were separated from their families and societies and sent to live in secluded areas where the institutions were built. It was assumed that mentally retarded individuals were unable to learn or live productive lives, and they were provided with food and shelter but did not receive vocational, social, and self-help training (Oliver et al., 1990).

Over the past several decades, the focus has shifted to deinstitutionalization and community inclusion. Since then, special education and family supports have expanded (Dykens, 2006). These programs were focused on self-determination, which encouraged PMR to make their own choices (Dykens, 2006).

### **Deficit Theory**

Individuals who are diagnosed with mild mental retardation often have deficits in social, cognitive, and adaptive functioning that impair their learning and memory. These deficits often create difficulty for these individuals in making and maintaining relationships (MacMillan, Siperstein, & Gresham, 1996).

#### **Deficits in Cognitive Skills**

Mild mental retardation is one type of mental retardation. Individuals with mild mental retardation have deficits in performing tasks involving abstract reasoning and

complex judgment. They require support in many activities of daily living. Although many individuals with mild mental retardation acquire basic literacy skills, these are typically limited to the fourth to six grade level. Individuals with mild mental retardation are capable of driving, obtaining employment at unskilled jobs that do not require abstract reasoning, decision-making, and can live independently with supports (Caffrey & Fuchs, 2007).

Caffrey and Fuchs (2007) conducted a study to assess learning performance between individuals with learning disabilities and individuals with mild mental retardation. In their experiment, they assessed the individuals' inductive reasoning, guided inquiry, and academic interventions. They found a statistically significant difference between these groups. In the inductive reasoning tasks, they required corrective feedback and the ability to master the tasks after training. Individuals with learning disability performed better on inductive reasoning. Although they experienced significant differences in learning, individuals with learning disorders and mild mental retardation showed gains from pretreatment and post treatment. Most individuals with mild mental retardation acquired the same ability to learn as those with learning disabilities.

The ability to determine similarity among objects and to categorize each object is essential for human adaptive functioning. Conceptual and categorical skills have been noted in theories of intelligence (Campione & Brown, 1984; Detterman & Sternberg, 1993; Salomom & Perkins, 1989). Individuals with intellectual disabilities have difficulty with generalization of learned skills. As a result, generalization of learned skills

is problematic with individuals with intellectual disabilities. Lack of training in generalization resulted in poor formation of conceptualization of learned skills (Hayes, 1997; Hupp & Mervis, 1982).

Researchers have identified similarities in how individuals with intellectual disability and those without disability organize conceptual information in semantic memory (Sperber & McCauley, 1984; Sperber, Ragain, & McCauley, 1976; Winter, 1985). Individuals with mild mental retardation are able to learn new information, but they are shown to learn at a slower rate than individuals without mental retardation. Such training can be done in a structured environment. Bomba and Siqueland (1983), Hayes and Taplin (1993b), and Younger (1990) concluded that individuals with intellectual disability were able to learn and transfer new information. This learning and transference can be done by providing training in areas of abstract reasoning.

### **Deficits in Emotion Recognition**

According to socioemotional selectivity theory, individuals selectively focus their attention on emotionally meaningful situations and goals due to time constraints. As they age, individuals tend to orient themselves toward positive facial expressions (Mather & Carstensen, 2003). Because selective attention to facial emotion is activated by the right superior temporal sulcus (Narumoto, Okada, Sadato, Fukui, & Yonekura, 2001), individuals with damage to the right hemisphere of the brain often have difficulty expressing emotional experiences. Not all PMR have deficits in this area; however, those who do experience challenges in facially communicating emotional experiences have difficulty in social situations.

Biological theorists have not discussed the empirical demonstrations of correlations between intelligence and biological measures (Eysenck, 1993). However, Rojahn et al. (1995) and Moore et al. (2001) identified difficulty accurately recognizing emotions in individuals with intellectual disabilities. They argued that this leads such individuals to have poor social skills. They argued that enhancing PMR's emotional recognition skills would improve their social skills. Training in the recognition of emotion has been shown to play a major role in social skills training (McAlpine et al., 1991; Owen et al. 2001); however, it is still unclear if training in facial expression recognition facilitates emotion recognition.

Appraisal theorists view emotions in an abstract manner (Frijda, 2006) and have argued that emotions arise from experiencing novelty, and environmental changes are based on intrinsic motivations. According to Frijda (2006), the sight of a particular object (e.g., snake) or noise (e.g., thunder) could elicit emotions. The appraisal process is often unconscious, particularly in novel situations. For example, a lecture might be interesting to one person, infuriating to another, and boring to a third person (Frijda, 2006). Emotion can be defined as a motivational function in relation to the individual's coping mechanism. Emotion is derived by the individual's personality and situations. The appraisal process causes an emotion and the appraisal outcome causes a physiological effect (Frijda, 2006).

Contemporary theorists described emotion in terms of physiological sensations, cognitive appraisals of situations, and cultural labels. Hochschild (1975, 1981), in the normative theory of emotion, asserted that gender differences in feelings and expressive

behavior are consistent with gender-specific emotional beliefs. Cultural beliefs regarding emotions determine an individual's ability to assess what he or she should and should not feel in each situation. The ability to discriminate and recognize facial expressions, which begins to develop in childhood, matures earlier in females than in males (Izard et al., 1971; McClure, 2000).

Facial expressions continue to be important elements in social communication. As such, the inability to decode these cues can impede social interactions and quality of life (Bozikas et al., 2004; Carton et al., 1999; Mah et al., 2004). The ability to perceive, process, and react in a socially appropriate manner requires good interpersonal skills (Leathers & Emigh, 1980; Muzekari & Bates, 1977; Vosk et al., 1993). Rojahn et al. (1995) found that individuals with mental illness such as schizophrenia, major depressive disorder, and developmental disabilities such as autism and mental retardation have difficulty decoding emotions. There is also a correlation between social skill deficits and maladaptive behaviors; however, it is unclear whether social skill deficits result in maladaptive behaviors (Bielecki & Swender, 2004).

The most important interpersonal skill is the ability to decode others' emotions in social interactions. This skill is essential because it provides information regarding nonverbal cues (Ekman et al., 1972). Persons with mild mental retardation have been shown by some researchers to have the ability to learn to decode facial expressions of emotions despite their challenges (Detterman, 1999; MacAlpine, Singh, Ellis, Kendall, & Hampton, 1992; Stewart & Singh, 1995). This finding has led to growing interest in emotional expression among PMR.

Recognition of emotion requires memory. The individual requires additional knowledge regarding the contingencies between the expression and many other stimuli in the world with which that expression has been directly or indirectly associated (Adolphs, 2002). Recognition requires that an individual knows about his or her environment, and so it requires memory (Adolphs, 2002). Recognition memory is one of the simplest forms of memory and may involve the ability to retain information in memory about early perceptual prepotencies of the visual image, to which another image can subsequently be compared (Adolphs, 2002).

Although some researchers find deficits among PMR on emotion recognition tasks, other researchers do not. Rojahn et al. (1995) found that PMR have difficulties recognizing expressed emotions when compared to individuals without intellectual disabilities. In their research, the accuracy of emotion recognition was correlated with the level of intellectual functioning, leading the authors to conclude that individuals with mild mental retardation might perform better than individuals with profound or severe mental retardation (Rojahn et al. 1995). In contrast, Levy, Orr, and Rosenzweig (1960) found no significant differences in the ability of individuals with mild mental retardation, mental illness, and no handicaps to recognize facial expression of emotions. Accordingly, additional research needs to be conducted to resolve this inconsistency.

### **Neuroanatomy of Emotion**

The brain regions that regulate emotion are the amygdala, cerebral cortex, basal ganglia, and the orbitofrontal cortex. Because production of facial expressions relies on many brain structures (Adolphs, 2002), researchers who measure facial expression

recognition in psychological and neurobiological studies often use advanced tools such as electroencephalography, magnetoencephalography, positron emission tomography (PET), and functional magnetic resonance imaging (fMRI). Researchers have identified the amygdala, pulvinar, and superior colliculus as the brain areas that control emotion (Vuilleumier, Armony, Driver, & Dolan, 2003). The analysis of emotional expression depends on the processing of the constituent parts and the global representation of the face as a whole (Tipples, Atkinson, & Young, 2002).

### **Neuroanatomical Structures of Emotion Recognition**

Aggleton (2000) reported that the amygdala and basal ganglia play a major role in facial recognition and social behavior. Aggleton found that individuals with lesions on the basal ganglia often experience difficulty recognizing facial expressions and that individuals with obsessive-compulsive disorder, Parkinson's disease, and Huntington's disease have difficulty recognizing emotions such as disgust (Aggleton, 2000).

The amygdala plays an important role in emotion and social behavior. Damage to the amygdala will impede one's ability to process facial expression (Aggleton, 2000). The amygdala obtains highly processed cortical information about faces and takes part in recognition. In contrast, some studies in human lesion studies indicate that damage to the amygdala cause severe impairment in recognition of fear (Adolphs, Tranel, Damasio, & Damasio, 1995; Anderson & Phelps, 2000; Brooks et al., 1998; Calder, Young, Rowland, et al., 1996; Sprengelmeyer et al., 1999). While some observed that damage to the amygdala would affect emotions such as fear, anger, disgust, and sadness (Adolphs, 1999; Adolphs, Tranel, et al., 1995; Schmolck & Squire, 2001). In humans the amygdala

is responsive to face and other visual stimuli. Fear is activated by the right and the left amygdala (Phan, 2002).

The orbitofrontal cortex is connected with the amygdala and both participate in the processing of rewarding and punishing contingencies of stimuli (Baxter, Parker, Lindner, Izquierdo, & Murray, 2000; Gaffan, Murray, & Fabre-Thorpe, 1993). In terms of social behavior, the prefrontal cortex, and in particular its orbital region is believed to play a role in the regulation of social relationships, cooperation, moral behavior, and aggression (Adolphs, 2002). Individuals with damage to this area have impairment in recognizing emotion from facial expression.

The cerebral cortex regulates both positive and negative emotions in the brain (Canli, Desmond, Zhao, Glover, & Gabrieli, 1999). Canli et al. (1999) conducted an analysis of fMRI and found that the cerebral cortex was activated in response to positive and negative emotions. They noted that positive emotion was activated by the left middle frontal gyrus and the left middle and the left superior temporal gyri. In contrast, the right inferior gyrus and the right gyrus were activated by negative emotion.

The basal ganglion is activated on the right hemisphere and participates in the recognition of facial emotion. Damage in the basal ganglia on both hemispheres will lead to impairment in emotion recognition (Caneliere&Kertesz, 1990). Individuals who are diagnosed with Obsessive-Compulsive Disorder, Parkinson's Disease, and Huntington's Disease with impairment on their basal ganglia had difficulties recognizing FEE (Sprengelmeyer et al., 1999).

The right hemisphere of the brain controls negative emotions whereas the left hemisphere controls positive emotions (Borod et al., 1998; Canli, 1999). The right hemisphere is involved with emotion recognition and social processing and tends to recognize faces quicker than the left hemisphere (Keenan et al., 2001; Keenan, Nelson, O'Connor, & Pascal-Leone, 2001).

### **The Importance of Facial Expressions**

Darwin (1872) explained that because facial expressions are universal among populations, evolved biological behaviors represent a universal repertoire of communication. Facial expressions are used in all populations to convey the six basic emotions: fear, anger, surprise, happiness, sadness, and disgust. Darwin described emotional expressions as remnants of movements that once served practical functions. Originating with the work of Darwin, theories related to the recognition of emotion are discussed, including the functional and dynamic system approaches to emotion, biological theories of intelligence, deficit theory, and the theory of mind. The effect of perception on emotion recognition, the sociological theories of gender and emotion, the need for effective treatment, and the importance of interpersonal skills for adults with mild mental retardation are also discussed.

### **The Recognition of Facial Emotion**

Social interaction requires the skills necessary to decode social cues and the emotions expressed in facial expressions. The psychological model of face processing suggests that perception depends heavily on the geometrical components of the face (Adolphs, 2006). Bruce and Young (1986) explained that perception depends on a

structural encoding process in which relatively specialized functional modules for recognition acquire information from the face. Adolphs (2002) found that the perception of facial emotion requires configural processing in relation to multiple facial features.

Proponents of categorical perception theory posited that emotional expressions are recognized due to their similarity with prototypical facial expressions associated with a basic set of emotions (Mendolia et al., 2007). The prototypical facial expressions of happiness, anger, disgust, fear, sadness, and surprise have many variations but share basic characteristics (Ekman et al., 1982; Izard, 1971; Tomkins, 1982).

Dimensional perception theory suggested that facial expressions of emotion are recognized based on their association with factors underlying the structure of emotions (Mendolia et al., 2007). Such labeling may be due to the initial perception of emotional categories or dimensions. Categorical perception occurs when the subject is able to identify the label relevant categories. Mendolia et al. (2007) indicated that categorical and dimensional perceptual strategies require the judgment process and the cognitive mechanisms involved in the recognition of expressed emotions. They argued that not all individuals possess the skills necessary to recognize emotional expressions.

Some researchers maintained that an individual's ability to recognize facial expressions of emotion depend on the type of emotion expressed (Elfenbein & Ambady, 2002; Russell, 1994). Although facial expression contributes to a range of social signals, the two distinct components in emotional recognition are the physiological reaction and the feeling of emotion, both of which depend on endocrine, visceral, autonomic, and musculoskeletal changes (Damasio, 1999).

In a study evaluating younger and older adults' ability to identify the six basic emotions using photographs, Calder (2003) found that older adults had difficulty labeling negative emotions. In a similar study, Sullivan and Ruffman (2004) concluded that older adults have greater difficulty decoding negative emotions. Philip and Allen (2004) concluded that age differences play a role in how individuals perceive emotions, with older adults' perceiving negative and positive emotions less intensely than younger adults.

The functionalist approach focuses on the nature of emotion whereas the dynamic approach focuses on emotional development (Fisher & Bidell, 1998; Mascolo & Fisher, 1995). Emotion depends on the individual's goals or concerns whereas emotional development occurs based on the change in each component. More specifically, the functionalist approach organizes emotions around the functions that they serve rather than a set of facial prototypes, autonomic signatures, or neurological patterns (Barrett & Campos, 1987; Fijda, 1986; Witherington, Campos, & Hertenstein, 2001). Because functionalists view emotions in terms of their adaptive value, they describe emotions as multicomponent adaptive systems (Saarni, Campos, Camras, & Witherington, 2006).

According to the functionalist approach, anger and fear are not characteristics of facial expressions or physiological states but rather indications of an adaptive, functional relationship between the organism and its setting (Witherington, 2007). For example, the action of smiling expresses emotions such as joy, scorn, nurturance, and embarrassment. Functionalists argued that an organism-environment relationship is emotional if it is significant to the individual's goals (Witherington, 2007). Individuals experience anger

when they perceive that an event is preventing the fulfillment of their goals, whereas they experience fear when they perceive that an event is threatening their well-being (Barrett & Campos, 1987; Saarni et al., 2006). Researchers have yet to elaborate on the relationship between components and the developmental change in these relationships, although some theorists identified themselves with both approaches and argued that there was some compatibility between the two approaches (Barrett & Campos, 1987; Saarni et al., 2006).

The dynamic system approach defines subsystems at a multitude of levels and posits that each subsystem is an important component in the emotional process. According to the dynamic systems approach, changes in one component of an emotional system may weaken the entire system, leading to changes in the relationships among the other components (Witherington, 2001). The dynamic system approach focuses on self-organization rather than the nature of emotion. Despite their differences, the functionalist and dynamic system approaches borrow from each other and both approaches view emotional expression as the process of the adaptation of the organism to its environment (Dickson et al., 1998; Lewis, 2000).

Withering (2007) reported that most researchers employ the functionalist and dynamic system approaches and that they have provided a wealth of information on emotion at multiple levels of analysis and explanation. However, most have explored the face in terms of specific brain potentials rather than emotional content. Herrman (2002) investigated the effect of different facial expressions by comparing expressions with several emotional valences. This was done to evaluate the relationship between the

conscious and unconscious decoding of facial expressions. In their study of the effect of unconscious psychological mechanisms on emotional recognition, Balconi and Lucchiari (2005) found that the left hemisphere is responsible for consciousness and decoding emotion.

Several researchers have investigated the role of motion in facial recognition. Christie and Bruce (1998) used face-learning techniques that employed animated pictures demonstrating both rigid and nonrigid motion. In rigid motion, the face remains in a three-dimensional form while the head changes position. When the researchers presented their subjects with tasks involving rigid motion, they found that the subjects' ability to identify emotion depended on repeated viewing. Although it appears easier to recognize the emotions expressed by moving faces, this sheds little light on characteristic motion signatures for faces that are already familiar. Natural motion states are easier to recognize than artificial morphed motion. There was an advantage for recognizing a face in motion when the face was moving. The authors concluded that the ability to decode facial expression will improve the individual's social skills.

### **Facial Expressions and Adaptive Functions**

Social skills are observable and measurable interpersonal behaviors that are shown to promote independence, social acceptability, and quality of life (Bielecki&Swender, 2004). Individuals with limited interpersonal skills have difficulties in recognizing emotions from facial expressions. Thus, enhancing individuals' ability to recognize emotion should improve interpersonal skills and enhance their social relationships and coping skills. Social-skills training enhanced the social competence of

persons with schizophrenia, pervasive developmental disorders, social anxiety, depression, and mental retardation (Coe, Matson, & Fee, 1990; Fee & Coe, 1991; Matson, Zeiss, Zeiss, & Bowman, 1980; Matson et al., 1988; Raymond & Matson, 1989).

McKinnon and Moscovitch (2007) indicated that social understanding requires both automatic modular processes and working-memory loading central processes. They argued that emotion decoding requires an automatic modular process that consists of two types of two sub processes: a perceptual process that is responsible for visual search and discrimination and a decision-making process responsible for emotional labeling.

Ekman and Friesen (1995) examined the ability to recognize facial expression using the Facial Affect Test. In this test, subjects rate the intensity of the six universal emotions in labeling tasks that require them to match faces to descriptions of emotions, sort faces, and judge the similarity between the emotions of different faces (Adolphs & Tranel, 2000). Results indicated that happy was easier to detect than other emotions.

Facial expressions communicate a range of social signals that can be observed in phasic changes in numerous physiological somatic and neural components (Damasio, 1995, 1999; Plutchik, 1980 Scherer, 2000). Eye-gaze direction has some similarities with facial perception (Langton, 2000; Langton, Walt, & Bruce, 2000). According to Adams and Kleck (2003), gaze direction played a major role in emotional perception. Direct gaze has been shown to increase the perception of approach-oriented emotions, such as joy and anger, whereas averted gaze increases the perception of avoidance-oriented emotion, such as sadness and fear. Human beings can detect whether another person is making eye contact with them (Gibson & Pick, 1963) but have difficulty making accurate judgment

as to where the person is looking when his or her gaze is directed somewhere in the environment (Lobmaier, Fischer, & Schwaninger, 2006; Schwaninger, Lobmaier, & Fisher, 2005; Symons, Lee, Cedrone, & Nishimura, 2004).

Most humans can innately infer emotions, intentions, and states of mind from facial expressions (Jellema & Pecchinenda, 2005; Tan, Jellema, & Pecchinenda, 2007). The information obtained from the face can be rich, misleading, and ambiguous because facial expressions often change rapidly. Interpretations of direct gaze and facial expression rely heavily on an individual's perception and emotional traits (Adams & Kleck, 2003, 2005). Direct gaze and facial expressions affect the individual's judgment of attractiveness; for example, individuals rated smiling faces as more attractive than neutral ones (Jones, DeBruine, Little, Conway, & Feinberg, 2006).

Researchers often categorize emotions by behavioral state, motivational state, mood, background emotion, emotional system, basic emotion, and social emotion (Adolphs, 2002). Behavioral states pertain to whether the individual chooses to approach or withdraw whereas motivational states pertain to reward, punishment, thirst, hunger, pain, and craving (Adolphs, 2002). Facial expressions can signal a specific outcome to an observer; a smile may indicate a positive emotion and an expression of fear may indicate a threatening situation. Faces are processed in a holistic manner in that recognition of a face can be impaired when it is presented in unfamiliar situations (Farah, Wilson, Drain, & Tanaka, 1998; Tanaka & Farah, 1993; Yin, 1969; Young, Hallowell, & Hay, 1987).

Facial characteristics play a major role in the perception and expression of emotions and intent (Schmidt & Cohn, 2001). An individual must detect another's

intention and emotional state rapidly in order to anticipate beneficial or dangerous situations (Eastwood, Frischen & Smilek, 2008). Facial expressions are processed automatically in that emotional expressions elicit rapid responses in the brain of the observer, even if the observer is not focusing on the facial expressions. Neuroimaging and neuropsychological assessments have confirmed that facial expressions are easily processed.

Individuals with social deficits have difficulty with cognitive processes, including working memory, which serves many functions in storing information (Andrade, 2001; Miyake & Shah, 1999), and is responsible for the maintenance of cognitive processes. Because the decoding of social cues relies heavily on working memory for precise performance, deficits in working memory can impede an individual's ability to perform tasks, including labeling facial expressions of emotion (Phillips, Channon, Tunstall, Hederstrom, & Lyons, 2008).

### **Facial Expression Research in the Intellectually Disabled**

Some researchers maintain that the ability to recognize facial expressions is compromised in intellectually disabled individuals; however, the results are mixed, and there is a paucity of research on individuals with PMR. Adams and Markham (1991), McAlpine et al. (1991), Rojahan et al. (1995), and Owen et al. (2001) purported that there is a correlation between intellectual disability and poor recognition of emotion in facial expressions. In their study using the FEEST to measure emotion recognition in individuals with intellectual disability, Young, Perrett, Calder, Sprengelmeyer, and Ekman (2002) asked participants to choose one emotion from among the six universal

emotions that best described the facial expression in the photograph presented. Results of the investigation revealed that older adults demonstrated a more conservative bias than did younger adults in all gaze conditions. The data from this controlled study may explain the discrepancy between the study by Levy et al. (1960) and more recent studies on the differential proficiency of individuals with and without mental retardation to recognize facial expressions of emotions accurately. Previous research in emotion decoding tasks indicated that individuals with impaired cognitive functioning are likely to have trouble labeling emotions (Phillips, Tunstall, & Channon, 2007).

Some researchers find that emotion recognition ability of intellectually disabled individuals varies as a function of their mood. In a study conducted to create an assessment device for individuals with intellectual disabilities, Woodcock and Rose (2007) noted that angry persons performed more poorly in emotion recognition tasks because they appeared to interpret facial expressions in a hostile manner. In their study, comparing the ability of aggressive and non aggressive individuals with intellectual disabilities to label photographs of facial expressions with emotions, Waltz and Benson (1996) found that aggressive individuals were more likely to misidentify facial expressions such as anger and sadness, whereas non aggressive intellectually disabled participants did not experience such deficits. Whitaker (2001) proposed that individuals with intellectual disabilities often experience anger due to their inability to understand emotions, and suggested that therapeutic intervention would be beneficial for them. Given this finding, additional research should be conducted to determine whether

intellectual disability or other factors contribute to facial expression recognition deficits in this population.

Facial expressions communicate a variety of emotional state of others (Darwin et al. 1872/1965). Nonverbal information is a key component for processing emotional expressions (Ekman, 2003; Young, 1998). Recognizing the emotions of others is essential in the development of a theory of mind. Children with autism have been shown to experience deficits in identifying facial expressions (Celani et al., 1998).

It has been established that individuals with autism spectrum conditions (ASC) have difficulties recognizing emotions in themselves and others. This impairment includes inability to engage in social emotional reciprocity and nonverbal communication such facial expressions, eye contact, and gestures (American Psychiatric Association, 2000). Autistic children are lacking in areas such as understanding what others are thinking or feeling, the ability not only to identify emotions and mental states of others, but also to employ that information to interact with others (Baron-Cohen, 2003, Wheelwright, Lawson, Griffin, & Hill, 2002; Lawson, Baron-Cohen, & Griffin & Hill, 2002; Lawson, Baron-Cohen & Wheelwright, 2004).

Emotion recognition difficulties in individuals with ASC were identified within cognitive, behavioral and neuroimaging studies (Frith & Hill, 2004). Most of these studies were focused on the six basic emotions. Studies in emotion recognition found to be inconclusive in children with ASC. In contrast, studies identifying complex emotions and mental states by children with ASC demonstrated consistent difficulties in emotion recognition (Griffiths, 1997). Numerous researchers have addressed the ability of both

children and adults with autism recognize facial expressions in others. Whereas some researchers reported the development of such skills in this population (Capps, Yirmiya, & Sigman, 1992; Gepner, Deruelle, & Grynfeldt, 2001; Ozonoff, Pennington, & Rogers, 1990), other researchers suggested it is impaired relative to controls. Hobson (1989) concluded that non-autistic children performed better on emotion than autistic children, but the difference was not significant. It was noted that individuals with autism showed improvement in the ability to recognize facial expression of emotions as they aged (Hobson, 1989, Humphreys, 2007; McDonald, 1989). As understanding emotion is important in understanding others' perspectives, some researchers have investigated the impact of training on emotion recognition.

### **Research on Training in Emotion Recognition**

Although there is empirical evidence demonstrating that the ability to recognize facial expressions may be compromised in intellectually disabled individuals, there is limited research available on how to augment facial expression recognition. Bauminger (2002) conducted a study to investigate the effectiveness of the use of a behavior based intervention to facilitate the emotion recognition skills in 15 high functioning children with autism, ages 8 to 17. This intervention consisted of lessons from social skills used in schools. As a consequence of the intervention, the children demonstrated improvement in emotional knowledge and ability to demonstrate examples of different emotions. This preliminary research suggests that gains in emotion knowledge and emotion production can be made as a function of intervention, research on emotion recognition needs to be conducted.

The ability to recognize facial expressions is a salient factor in establishing interpersonal relationships. Appropriate training in recognition of facial expressions serves as important signals employed to understand the feeling and intentions of others and it was noted that emotion recognition of emotions is universal (Darwin, 1872; Ekman, 2003); however there is little research on this topic in intellectually disabled individuals and no research on this topic in a PMR population. The purpose of the current investigation is to add to literature on the efficacy of training of expression recognition in a PMR population.

### **Social Change**

Social change is the process of developing and applying ideas, strategies, and actions to promote the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies, thus improving individual lives and social conditions. As a scholar-practitioner whose goal is to promote positive social change, the researcher of this study investigated whether training in the recognition of facial expressions enhanced the social skills of adults with mental retardation. As a social-change agent, the researcher's main goal was to assist her clients by providing the appropriate interventions.

### **Summary**

This chapter explored research in the recognition of facial expressions of emotion. The few researchers who have conducted research into the area of the emotion recognition of PMR have found that training in emotion recognition enhances these adults' interpersonal skills; however, no research on the extension of this training to

impact future emotion recognition has been conducted. It has been established that lack of interpersonal skills contributes to social isolation and poor interpersonal skills, and training in emotion recognition skills can improve social functioning (McAlpine et al., 1992); however, it is unclear whether facial expression training can result in augmented emotion recognition ability, especially in a PMR population. The current investigation will add to the literature on this topic. Chapter 3 provides a discussion of the methodology that the researcher will employ to achieve the study objectives and answer the research questions presented in Chapter 1.

## Chapter 3: Research Method

### **Introduction**

The purpose of the current investigation was to determine the effect of a training program in the recognition of facial expression on future emotion recognition in a PMR population and to determine if gender, age, and baseline emotion recognition impact recognition skills. Another purpose of the investigation was to validate the use of the FEEST in a PMR population. Although the FEEST has been used extensively with individuals without mental retardation, and it is approved for use in a PMR population, the application of this assessment tool in a PMR population has not yet been empirically investigated. Previous studies indicated that individuals with mental retardation are lacking in the ability to decode emotion and that members of this population may benefit from training in these skills (McAlpine et al., 1991). Emotion recognition involves discrimination, identification, interpretation, and labeling emotions. Individuals with mild mental retardation are deficient in decoding emotional cues. Therefore, appropriate training in decoding emotional cues may be beneficial to adults with mild mental retardation. This section contains a description of the methods and procedures used in this study, including research approach, design, and variables, participants, study materials, data collection procedure, data analysis procedure, ethical protection of participants, and summary.

## **Research Approach, Design, and Variables**

### **Research Approach**

The aim of this quantitative study was to determine whether a facial expression training program impacts the ability of adults with mild mental retardation to recognize facial expressions of emotions correctly. The quantitative research method is appropriate when examining the relationship or differences between variables (Vogt, 2007). A quantitative research methodology was deemed appropriate as numeric comparisons of before and after training program scores were made in order to evaluate the efficacy of a training program.

### **Research Design**

The research design for the current study was an intervention response design with a pretest and a posttest. Secondary data from the Association for the Help of Retarded Children Day Program (AHRC) at the Joseph T. Weingold Center in Queens New York were analyzed in the investigation. Although the initial data were collected in a controlled manner, there was no control group and no random assignment of trainees to conditions; therefore, the study is considered a quasi experiment. The use of an intervention response design is considered appropriate as the purpose of the study was to evaluate how the predictor variables of gender, age, and baseline FEEST score predict the difference between FEEST assessment I (pretest) and FEEST assessment II (posttest) scores in a new population.

## **Variables**

The secondary data set from the AHRC consisted of the following variables: FEEST assessment I scores, FEEST assessment II scores, gender, and age information. The dependent variable for the current study, change in recognition ability, was defined as the difference between the FEEST assessment I and FEEST assessment II for each trainee. The predictor variables of gender, age, and FEEST assessment I score were used to determine whether or not they predict the difference between the FEEST assessment I and II scores. After initially getting the baseline information, pretest and posttest data were collected for 5 weeks. At the end of the 5 week period, composite (mean) scores were calculated for each (pretest and posttest). The composites scores were then used to compute the mean differences which were used in the regression analyses (H1-H3) and *t* test (H4). In other words, the mean differences used in the analyses were the culmination of 5 weeks' worth of data collection activities.

## **Research Questions and Hypotheses**

### **Research Question**

Does training of facial expression characteristics increase future emotion recognition scores in a PMR population, and are gender, age, or FEEST assessment I scores related to the difference between FEEST assessment I and FEEST assessment II scores?

### **Hypotheses**

**H1<sub>0</sub>.** There will be no significant difference between FEEST assessment I and FEEST assessment II scores.

**H1<sub>a</sub>.** There will be a significant difference between FEEST assessment I and FEEST assessment II scores.

**H2<sub>o</sub>.** Gender will not predict the difference between FEEST assessment I and FEEST assessment II.

**H2<sub>a</sub>.** Gender will predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>o</sub>.** Age will not predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>a</sub>.** Age will predict the difference between FEEST assessment I and FEEST assessment II.

**H4<sub>o</sub>.** Baseline FEEST score will not predict the difference between FEEST assessment I and FEEST assessment II.

**H4<sub>a</sub>.** Baseline FEEST score will predict the difference between FEEST assessment I and FEEST assessment II.

### **Participants**

Secondary analyses were performed on the assessment and demographic data from approximately 31 individuals who participated in an emotion training program at AHRC. Although 35 trainees participated in the first phase of the training, only 31 trainees completed the training. Two trainees could not complete the training due to Hurricane Sandy causing power outages and disruption in New York City in 2012. These trainees relocated and could not attend the program during the outage period. Two other

trainees dropped out of the training. The training occurred over a period of 12 weeks. This represents an 88.5% response rate (31 trainees) of those who completed the training.

Participants were trainees aged 18 and older, who had been diagnosed with mild mental retardation and were currently enrolled in pre vocational and supportive work programs. The program trainees were invited to release their assessment and demographic data for research purposes and were informed that the data release was not mandatory. Their access to the program was not impacted by their decision to release (or not to release) the data for research purposes. The sample size of the data set was derived by considering the number of predictor variables for the current investigation and multiplying that number by 10. The requisite number for the sample was 30.

### **Study Materials**

#### **Emotion Recognition Assessment Instrument**

The assessment data that the trainees elected to release for the current study consisted of emotion recognition assessment scores and demographic information of age and gender. Emotion recognition assessments were made with the Facial Expression of Emotions Stimuli and Test (FEEST). Two FEEST assessments were administered as part of the training program and are referred to as FEEST time I and FEEST time II. The FEEST assessment consists of eight sets of black and white pictures showing the six basic emotions (happy, sad, anger, fear, surprise, and disgust). These 48 high-quality pictures were developed and normed by Ekman and Friesen (1975). The FEEST was developed to serve as a valid and reliable measure of the ability to recognize facial expressions of emotion. The FEEST is a self-report inventory that is used to assess the

recognition of affect from facial expression. It consists of three computer-administered sections that present images which have been derived from pictures of expressions in the Ekman and Friesen (1975) series. The FEEST has two formats for administration, the picture-story format and the CD format. The data for the current investigation consisted of responses to the picture-story format.

Numerous researchers have used the FEEST to measure emotion recognition and it is currently the most extensively used set of stimuli in research on the recognition of facial expressions, since its development by Ekman and Friesen in 1975. The FEEST has been used to assess emotions of people at the normal IQ and mild mental retardation levels. Reliability estimates of the FEEST have been established by numerous researchers (McAlpine, Kendall, & Singh, 1991; McAlpine, Singh, Kendall & Elis, 1992), and the FEEST has demonstrated good reliability.

### **Emotion Recognition Training Program Protocol**

Detailed procedural information on the training program protocol that the trainees participated in is attached (see Appendix A). Baseline information, pretest, and posttest data was collected for 5 weeks. The independent variable of training was operationally defined as 5 (one time per week, for five weeks) 20 minute sessions. Each emotion program trainee received the training individually.

### **Data Collection Procedures**

Following approval from the Walden University Institutional Review Board, 50 HIPPA compliant PHI Release forms were sent to the trainees, and 35 forms were signed and returned by the trainees and their guardians. Although 35 trainees participated in the

first phase of the study, only 31 trainees completed the study. All clients who participated in the training program were given the option to release their assessment and demographic data for use in the proposed research study. Data from trainees who elected to have their assessment and demographic data analyzed for research purposes will then be released from AHRC to the researcher. All personal identification information from the trainees was removed from the data prior to release. A data file consisting of the FEEST assessment I scores, FEEST assessment II scores, age, and gender information for each subject, identified by number only, was created in the Statistical Package for the Social Sciences (SPSS).

### **Data Analysis Procedure**

Descriptive analyses were conducted and consisted of the computation of means and standard deviations for FEEST scores on pretests and posttests for all subjects, and frequency data for gender and age of participants. The mean composite scores were then used to compute the mean differences which were used in the regression analyses (H1-H3) and *t*-test (H4). The data ENTER method was used in which all the predictor variables (age, gender, and baseline score) were simultaneously entered into the regression equation to examine the model's predictive capability. Goodness-of-fit was examined via inspection of a scatterplot of the standardized residuals to check for evidence of homoscedasticity. The collinearity diagnostics was run with attention given to the variance inflation factor and tolerance statistics to check for multicollinearity. That is, the mean difference scores used in the analyses were the culmination of 5 weeks' worth of data collection activities. A paired samples *t* test was used to determine whether

or not there were significant differences between FEEST assessment I and FEEST assessment II (hypothesis one). The 0.05 level of confidence was used to determine whether the null hypothesis was accepted or rejected. Multiple regression analyses were used to determine whether or not gender, age, and baseline FEEST score predicted assessment differences scores (hypotheses two through four), and a Cohen's Kappa reliability analysis was also conducted to determine the internal consistency reliability of the FEEST in a PMR population.

### **Ethical Protection of Participants**

Prior to participation all aspects of the study were approved by the IRB Walden University Institutional Review Board (#08-14-12-0044951). Although the researcher is currently a supervised volunteer at AHRC, the program trainees were informed that the data release was not mandatory, and that their access to the program would not be impacted by their decision to release (or not release) the data for research purposes.

The trainee's test scores were held strictly confidential. The names were removed from the test scores and a unique identification number was assigned to the participants prior to the researchers accessing of score data. Collected data was stored in a secure setting including a locked filing system and a disk of content added to the locked filing system.

### **Summary**

The aim of this study was to assess the impact of an emotion training program designed to teach individuals with mild mental retardation to recognize facial expressions of emotion. This study produced data that may aid in the development of appropriate

training programs for this population. In summary, this study offers a unique contribution to the field of mental retardation being the first to examine the efficacy of an expression training protocol on the abilities of adults with mild mental retardation to recognize facial expression of emotions.

## Chapter 4: Results

### **Introduction**

The purpose of the current investigation was to determine the effect of a training program in the recognition of facial expression on future emotion recognition in a PMR population and to determine if gender, age, and baseline emotion recognition impact recognition skills. Another purpose of the investigation was to validate the use of the FEEST in a PMR population. Secondary analyses were performed on the assessment and demographic data from approximately 31 individuals whom participated in an emotion training program at AHRC. This secondary analysis included 31 trainees aged 18 and older, which had been diagnosed with mild mental retardation and enrolled in pre vocational and supportive work programs. The remaining sections of this chapter include the research questions and hypotheses, descriptive statistics, inferential results of the study, an additional analysis section, and a summary.

### **Research Questions and Hypotheses**

#### **Research Question**

Does training of facial expression characteristics increase future emotion recognition scores in a PMR population, and are gender, age, or FEEST assessment I scores related to the difference between FEEST assessment I and FEEST assessment II scores? The FEEST consists of 60 pictures from the Ekman test. All of the images used in the FEEST are derived from pictures of facial expressions in the Ekman and Friesen (1976) series of pictures of facial affect. It is a validated series of photographs in facial expression research. The test yields a score out the maximum of 60 correct for

recognition of all six emotions and scores out of 10 for the recognition of each basic emotion. The computer software presented each image in a random order for 5 seconds, and participants recorded a response by clicking the mouse or touching the screen of the computer. Comparison data were available for 227 individuals aged 20-70 years with IQ of 90 and above.

### **Hypotheses**

**H1<sub>o</sub>**. There will be no significant difference between FEEST assessment I and FEEST assessment II scores.

**H1<sub>a</sub>**. There will be a significant difference between FEEST assessment I and FEEST assessment II scores.

**H2<sub>o</sub>**. Gender will not predict the difference between FEEST assessment I and FEEST assessment II.

**H2<sub>a</sub>**. Gender will predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>o</sub>**. Age will not predict the difference between FEEST assessment I and FEEST assessment II.

**H3<sub>a</sub>**. Age will predict the difference between FEEST assessment I and FEEST assessment II.

**H4<sub>o</sub>**. Baseline FEEST score will not predict the difference between FEEST assessment I and FEEST assessment II.

**H4<sub>a</sub>**. Baseline FEEST score will predict the difference between FEEST assessment I and FEEST assessment II.

### Descriptive Analyses

The sample included 15 (48.4%) male and 16 (51.6%) female trainees. As shown in Table 1, the majority of trainees were between ages of 23-28 (35.6%).

Table 1

#### *Trainee Ages*

Age Range	Frequency	Percent
23-28	11	35.60%
29-34	4	12.80%
35-40	2	6.40%
41-46	3	9.80%
47-52	2	6.50%
53-58	1	3.20%
59-64	4	12.80%
65-69	4	12.80%

### Inferential Statistics

**Hypothesis 1.** To evaluate Research Hypothesis 1, (i.e., there will be a significant difference between FEEST assessment I and FEEST assessment II scores) a paired samples *t* test was used. The results of the analysis indicated that there was no significant difference between the pretest ( $M = 5.26$ ;  $SD = .68$ ) and the posttest FEEST scores ( $M = 5.29$ ;  $SD = .89$ ),  $t(30) = -.232$ ,  $p = .82$ . That is, the null hypothesis was not rejected and the training that took place following pretesting had no impact on the posttest score.

**Hypotheses 2 through 4.** A multiple regression analysis was used to evaluate Hypothesis 2 (i.e., gender will predict the difference between FEEST assessment I and FEEST assessment II), Hypothesis 3 (i.e., age will predict the difference between FEEST assessment I and FEEST assessment II), and Hypothesis 4 (i.e., baseline FEEST score will predict the difference between FEEST assessment I and II). The regression analysis revealed that none of the variables predicted assessment differences. The set of variables (model) used in the analysis (age, gender, and baseline score) had no ability to predict the difference between the FEEST I and FEEST II assessments,  $R^2 = .14$ ,  $F(3, 27) = 1.0576$ ,  $p = .218$  (see Table 2). That is, gender did not significantly predict assessment differences,  $\beta = -.250$ ,  $t(27) = -1.38$ ,  $p = .18$ ; age did not significantly predict assessment differences,  $\beta = -.153$ ,  $t(27) = -.830$ ,  $p = .41$ ; and baseline score did not significantly predict assessment differences,  $\beta = -.122$ ,  $t(27) = -1.65$ ,  $p = .11$ .

Table 2

*Analysis of Variance*

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.714	3	0.571	1.576	0.218
Residual	9.786	27	0.362		
Total	11.499	30			

a. Dependent Variable: Mean Difference

b. Predictors: (Constant), Baseline, Gender, Age

The coefficient pivot table (see Table 3) indicates the performance of each of the predictors in which, similarly, none of them had a statistically significant  $p$  value: gender ( $p=.179$ ), age ( $p=.414$ ), and baseline score ( $p=.110$ ). Thus the model submitted for analysis had no predictive capability in this study.

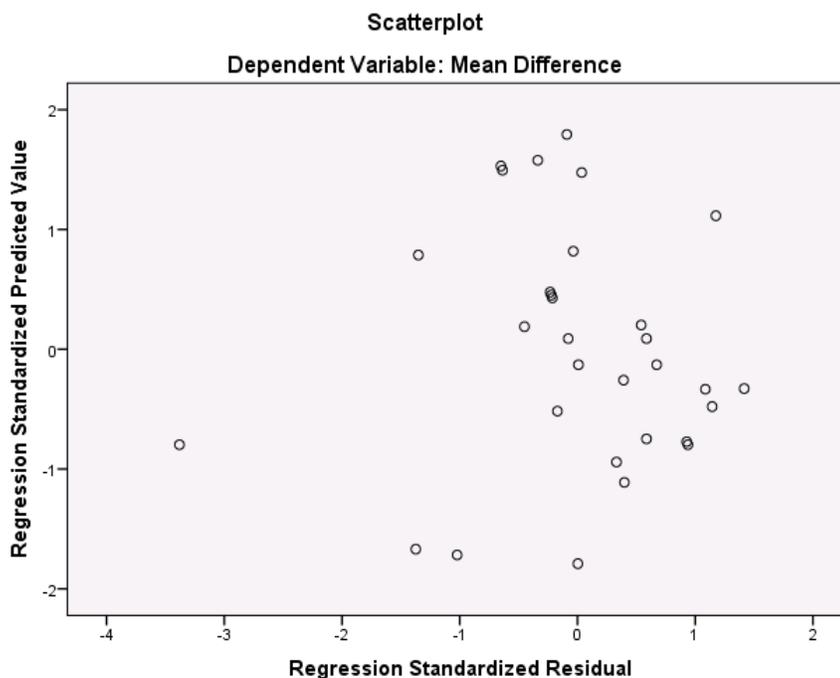
Table 3

*Summary of multiple regression analysis (n = 31)*

Variable	Coefficients		Collinearity Statistics			
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>Sig.</i>	<i>Tolerance</i>	<i>VIF</i>
Constant	1.323	0.643		0.049		
Gender	-0.304	0.22	-0.25	0.179	0.964	1.037
Age	-0.006	0.007	-0.153	0.414	0.923	1.084
Baseline	-0.122	0.074	-0.301	0.11	0.955	1.047
$R^2$			0.149			
$F$			1.576			

A scatterplot of the standardized residuals is a diagnostic procedure to examine the goodness-of-fit of the data for the regression model (see Figure 1). When the model is appropriate no discernible pattern should be evident. However, in this case, there is a clearly noted linear pattern to the residuals indicating they are unevenly distributed along the regression line. The variance inflation factor (VIF) for the predictor variables ( $< 10.0$ ) indicated an absence of multicollinearity in the data and the null hypothesis was accepted

for hypotheses two through four. That is, age, gender, and baseline scores did not predict any difference between FEEST I and FEEST II.



*Figure 1.* Scatterplot.

### Additional Analysis

As another purpose of the investigation was to validate the use of the FEEST in PMR population, an internal consistency reliability analysis was conducted. Cohen's kappa was used to evaluate agreement between the between the pre-test and post-test scores. Although the kappa values for the pretest-posttest assessments were not significant, the results indicated that during the 5 week data collection period the most similarity between the two assessments occurred during Week 5 (.204), Week 3 (.173), and Week 4 (.151).

### Summary

In summary, there were no differences in trainees' pretest FEEST I score and posttest FEEST II score and research hypothesis one was not supported. Research hypotheses two through four were also not supported and gender, age, and baseline FEEST score did not predict difference scores. Cohen's Kappa reliability analyses were not significant, but indicated that during the 5 week data collection period the most similarity between the two assessments occurred during Week 5 (.204), Week 3 (.173), and Week 4 (.151). Chapter 5 summarizes the discussion, conclusion, and recommendations.

## Chapter 5: Discussion, Implications, and Recommendations

### Introduction

The purpose of the current investigation was to determine the effect of a training program in the recognition of facial expression on future emotion recognition in a PMR population and to determine if gender, age, and baseline emotion recognition impacted recognition skills. Another purpose was to validate the use of the FEEST in a PMR population. The nature of the study was to describe the differences between the pre- and posttest scores on the FEEST based on gender and age of the trainees. All trainees were able to identify the six basic emotions accurately. In this chapter, a description of the interpretations of findings, limitations of the study, conclusions, and recommendations will be provided.

### Interpretations of Findings

**Hypothesis one.** The null hypothesis for hypothesis one was accepted because no statistically significant difference was found between the FEEST assessment I and FEEST assessment II scores. That is, the mean and standard deviations for the facial recognition task on both FEEST I and FEEST II were similar, indicating the activities that took place following pretesting had no impact on the posttest score. As this study is the first to assess the effects of an emotion training program in a PMR population, these results cannot be compared to the previous literature as it relates to individuals with mild mental retardation. However, the results do not support the literature that indicated older aged individuals can benefit from emotion training (Wright et al., 2008). Further research involving a larger number of trainees would be needed to confirm the findings of

the present study. McKenzie et al. (2000) found that the accuracy of identifying emotions from pictures improved with training when they were provided in contextual information. It was also noted that emotion recognition varied with age in PMR population.

In the present study the trainees were unimpaired in their ability to recognize the six basic emotions. Although they were able to identify the six basic emotions, it was unclear if they would be able to apply their knowledge in all settings. In future research, the inclusion of emotional dimensional and categorical approaches may allow for a more sensitive measure of emotions. Training aimed at enhancing emotion recognition skills for this population should incorporate the emotional dimension approach, in addition to categorical approaches. Cognitive behavioral therapy will assist them in understanding anger and how to cope with angry feelings. According to Owen et al. (2001), enhancing emotion recognition is crucial in social skills training in the PMR population. Difficulties with social adaption were prominent with individuals with intellectual disability. It is important to identify ways to improve their social skills as well as identifying appropriate training models to shape the environment to foster social inclusion in PMR population. Enhanced emotion recognition skills will assist individuals in selecting appropriate behavioral responses in all interaction thus improving their interpersonal skills.

**Hypothesis 2.** The null hypothesis for the second hypothesis was also accepted as the regression analysis revealed that gender did not predict differences between Assessment I and Assessment II. Contemporary theorists described emotion in terms of

physiological sensations, cognitive appraisals of situations, and cultural labels.

Hochschild (1975, 1981) in the normative theory of emotion and asserted that gender differences in feelings and expressive behavior are consistent with gender-specific emotional beliefs. Cultural beliefs regarding emotions determine an individual's ability to assess what they should and should not feel in each situation. The ability to discriminate and recognize facial expressions, which begins to develop in childhood, matures earlier in girls than in boys (Izard et al., 1971; McClure, 2000). In this current study, gender did not predict differences between the two assessments. Both male and female performed equally well. One of the reasons why their scores were similar could be due to their high level of function. The six basic emotions were not as difficult as perceived based on the literature search for the current study. Previous research indicated that ability to recognize facial expression of emotions was correlated with their level of functioning. Individuals with Mild Mental Retardation tended to score higher than individuals with a Moderate and a severe learning disability (Rojahn et al., 1997).

**Hypothesis 3.** The null hypothesis for the third hypothesis was also accepted and the regression analysis revealed that age did not predict differences between Assessment I and Assessment II. This finding does not corroborate findings from a previous study conducted by McKenzie et al. (2000) who found that emotion recognition varied with age. In a study evaluating younger and older adults' ability to identify the six basic emotions using photographs, Calder (2003) found that older adults had difficulty labeling negative emotions. In a similar study, Sullivan and Ruffman (2004) concluded that older adults have greater difficulty decoding negative emotions. Philip and Allen (2004)

indicated that age differences played a role in how individuals perceive emotions, with older adults perceiving negative and positive emotions less intensely than younger adults. Results of their investigation revealed that older adults demonstrated a more conservative bias than did younger adults in all gaze conditions. The data from Phillip and Allen's controlled study may explain the discrepancy between a study by Levy et al. (1960) and more recent studies on the differential proficiency of individuals with and without mental retardation to recognize facial expressions of emotions accurately. The results from the current study did not indicate any differences between the pretest scores and the posttest scores. Age did not predict any difference between the two assessments.

**Hypothesis 4.** For the fourth hypothesis, the null hypothesis was also accepted as baseline scores did not predict assessment I and assessment II differences. There was no previous research on this topic to compare to the current study. The aim of this study was to evaluate the effectiveness of emotion training in a PMR population and what impact there is in social functioning. Clinical implications will be discussed.

Finally, there has been an increase in interest in using cognitive behavioral therapy for individuals with intellectual disability. Emotion training can help create an appropriate therapy model and it will provide useful information to facilitate successful adaptation of cognitive behavioral therapy. Individuals with intellectual disabilities have difficulties with anger management. They have difficulties identifying anger in themselves and in others. Additional research should be conducted to determine if FEEST can help create successful adaptation of cognitive behavioral techniques.

### **Limitations of the Study**

There were several weaknesses of the current investigation that may have contributed to the lack of significant findings. One weakness that may have contributed to the similar mean scores in the pre- and posttest assessments was the length of the training. Future research should be conducted implementing a longer training period, either per session or number of sessions. If they had a perfect score, there would not have been any significant difference between the pretest and posttest. Other methodological weaknesses were the small sample size and use of secondary data. Use of secondary data does not allow the researcher to validate the accuracy of data collection, and the researcher must trust that data collection was done correctly and with the rights of the participants honored. Future experimental research with random assignment to treatment or control group with a larger sample size should ameliorate these methodological questions and their impact on the current findings.

A limitation of the study was that the results might not be able to be applied to individuals with the same disability outside of New York City. As this study was limited to adults with mild mental retardation who are enrolled in sheltered workshops and supportive work programs, it was unclear if the results could be generalized to mentally retarded individuals who did not participate in these types of programs. Another limitation was that the trainees had no comparable age or gender matched control subjects who did not participate in the training. The original training procedure did not include tasks to control for the effects of nonemotion related tasks (Owen et al., 2001),

and future research should be conducted to determine how salient a factor this was for the current research.

The results were based on a small sample size, and the results were not statistically significant. Further research with a larger sample size and a longer period of training would be needed to confirm the findings of the present study. It remains unclear if the trainees will be able to generalize skills learned to a diversified environment, given the fact that the trainees' scores were similar in the pretest and posttest. As discussed, this limitation may have compromised the results of the study.

### **Recommendations for Actions**

It is recommended that clinicians be provided with tools necessary to enhance the ability of adults with mild mental retardation to recognize facial expressions of emotions. Inability to identify emotions in themselves or others will impede their ability to establish or maintain relationships with others. The ability to understand, express, and recognize facial expressions is an important factor in social interaction. Researchers have found that PMR often have difficulty recognizing the emotions of sadness, fear, disgust, anger, and surprise (Gray et al., 1983; Maurer & Newbrough, 1987; McAlpine et al., 1991). Although emotion recognition training was not found to impact emotion recognition scores in the current study, these findings may be due to the study limitations and additional research should be conducted. Indeed, researchers identified a need for such training for individuals both with and without mental retardation (Leather & Emigh, 1980; Muzekari & Bates, 1977; Vosk, Forehand, & Figueroa, 1993), and the current study was the first to evaluate the impact of emotion recognition training on emotion recognition

outcomes in a PMR population. Future research should be conducted to identify what components of training could be used to improve emotion recognition, and how many training sessions are necessary. It is suggested that training aimed at enhancing emotion recognition skills for individuals with intellectual disabilities should include emotional dimension approach, in addition to categorical approach to emotion.

### **Recommendations for Future Research**

The accurate assessment of emotion recognition is important, as the results of an assessment can assist clinicians in identifying deficits so appropriate training interventions can be implemented. Bielecki and Swender (2004) maintained that emotion cognition training has been shown to improve the lives of PMR and to contribute to successful community integration; however, no research on emotion recognition training had been conducted until this study. Further research with a larger sample should be conducted to confirm the findings of the present study. The results of the current study suggest that the identification of the six basic emotions was not difficult for the trainees. As a consequence, it may be that facial emotion training with this population is not necessary; however, additional research will be needed to support this finding. It is also recommended that more difficult recognition measurement tasks should be included in future research to avoid possible ceiling effects associated with the FEEST. The research design might not have had the power to tease out results given the size of the sample and the effect size. The study needs either a more sensitive test or larger sample. Another recommendation would be a series of three administrations of the FEEST, one in baseline, one 3 months later without any training in recognition emotions in faces, then a

third administration after 3 month period of training. The researcher can distinguish between maturation and learning. The first comparison looks at change in skill as the person ages, and the second comparison is change due to training. The researcher might be well served by having another prediction variable, like IQ, to put into the regression equation. Like a rank ordering by staff of the trainees relative social skills correlated with the score on the FEEST. In the current study the trainer used two models to analyze data, the regression analysis and *F* test for significant difference. Both showed no measurable effect.

### **Implications for Social Change**

The results of this study may contribute to the social change agent and it can assist other professionals in creating appropriate training tools to improve the recognition of emotions. This in turn may increase positive social and adaptive interactions of individual with mild mental retardation. The ability to identify emotional cues in themselves and others is important because such cues will improve their coping skills and problem solving skills. McAlpine et al. (1991) maintained that underdeveloped emotion recognition skills may lead to inappropriate social interaction and can contribute to social rejection or social isolation. Belack et al. (1993) noted that if social skills are not developed, individuals with mental retardation may develop other maladaptive behaviors such as avoidance behavior and avoiding interpersonal contact, which can create adaptive problems such as isolation, inability to hold jobs, and lack of understanding of how to behave in social situations.

It is important to determine the impact of facial emotion training on future emotion recognition as the consequences of lack of recognition are so detrimental. Thus, enhancing individuals' ability to recognize emotion will improve interpersonal skills and enhance their social relationships and coping skills. Social-skills training enhanced the social competence of persons with schizophrenia, pervasive developmental disorders, social anxiety, depression, and mental retardation (Coe, Matson, & Fee, 1990; Fee & Coe, 1991; Matson, Zeiss, Zeiss, & Bowman, 1980; Matson et al., 1988; Raymond & Matson, 1989). The current study did not find the FEEST training effective; however, the results may be due to study limitations or a ceiling effects and future research should be conducted to determine if the current findings can be corroborated.

### **Conclusion**

In summary, this present study indicated that the current training protocol in emotion identification did not result in significant increases in these skills, as measured by accuracy of identifying emotions from pictures depicting a range of information and tasks demands. The lack of significant findings related to the training module used in the current study could be attributed to several weaknesses in the current study and additional research should be conducted. Still, this study offers a unique contribution to the field of mental retardation being the first to examine the efficacy of an expression training protocol on the abilities of adults with mild mental retardation to recognize facial expression of emotions.

## References

- Adams, R. B., & Kleck, R. E. (2003). Perceived gaze direction and the processing of facial displays of emotion. *Psychological Science, 14*, 644-647.
- Adams, R. B., & Kleck, R. E. (2005). Effects of direct and averted gaze on the perception of facially communicated emotion. *Emotion, 5*, 3-11.
- Adams, K. & Markham, R. (1991). Recognition of affective facial expressions by children and adolescents with and without mental retardation, *American Journal on Mental Retardation, 91*, 21-28.
- Andrade, J.K. (2001). An introduction to working memory. In J. Andrade (Ed.) *Working memory in Perspective*, pp. 3-30. Hove, UK: Psychology Press.
- Adolphs, R., Tranel, D., Damasio, H., & Damasio, A.R. (1995). Fear and the human amygdale. *Journal of neuroscience, 15*, 5879-5892.
- Adolphs, R., Damasio, A. R., & Tranel, D. (1998). The human amygdale in social judgment. *Nature, 393*, 470-474.
- Adolphs, R., & Tranel, D. (1999). Intact recognition of emotional prosody following amygdale damage. *Neuropsychologia, 37*, 1285-1292.
- Adolphs, R. (2002). Neural systems for recognizing emotion. *Current opinion in Neurobiology, 12*, 169-177.
- Adolphs, R. (2006). Perception and emotion: How we recognize facial expressions. *Association for psychological Service 15(5)*, 222-226.
- Anderson, A.K, & Phelps, E.A. (2000). Expression without recognition: Contributions of the human amygdale to emotional communication. *Psychological Science, 11*, 106- 111.
- Aggleton, J.P., Young, A.W. (2000). The enigma of the amygdale: On its contribution to human emotion. In L. Nadel & R.D. Lane (Eds.). *Cognitive Neuroscience of emotion* (p. 106-128). New York: Oxford University Press.
- Allen, R., & Phillips, L.H. (2004). Adult aging and the perceived intensity of emotions in faces and stories. *Aging: Clinical and Experimental Research, 16*, 190-199.
- Ambady, N., Rosenthal, R. (1992). Thin slices of expressive behavior as predictor of interpersonal consequences: A meta-analysis. *Psychological Bulletin, 111*, 256-274.
- American Association on Mental Retardation Ad Hoc Committee on terminology and

classification. (2002). *Mental retardation: Definition, classification, and systems of supports* (10<sup>th</sup> Ed.). Washington DC: American Association on Mental Retardation.

American Psychological Association. (2000). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed., Text rev.). Washington, DC: Author.

Anezoulaki, D., Bozikas, V.P., Giannakou, M., Karavatos, A., & Kosmidis, M.H. (2004). Relationship of affect recognition with psychopathology and cognitive performance in schizophrenia. *Journal of the International Neuropsychological Society*, 10, 549-558.

Balconi, M., & Lucchiari, C. (2005). Consciousness, emotion and face: An event related potentials (ERP) study. In R.D. Ellis & N. Newton (Eds.), *Consciousness and emotion. Agency, conscious choice, and selective perception* (pp. 121-137). Amsterdam: John Benjamins.

Blatt, B., & Kaplan, F. (1966). *Christmas in Purgatory*. Boston: Allyn & Bacon.

Bates, E., Muzekari, L.H. (1977). Judgment of emotion among chronic schizophrenics. *Journal of Clinical Psychology*, 33(3), 662-666.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The reading the mind in the Eyes test revised version: A Study with normal adults, and adults with Asperger Syndrome and high functioning autism. *Journal of Child Psychology and Psychiatry*, 42, 241-251.

Baron-Cohen, S. (2003). *The essential difference: Men, women, and the extreme male brain*. London: Penguin.

Baron-Cohen, S., Golan, O., Wheelwright, S., & Hill, J.J. (2004). *Mind reading: The interactive guide to emotions*. London: Jessica Kingsley Limited ([www.jkp.com](http://www.jkp.com)).

Barrett, K. C., & Campos, J. J. (1987). Perspectives on emotional development: II. A functionalist approach to emotions. In J.D. Osofsky (Ed.), *Handbook of infant development* (2<sup>nd</sup> ed., pp.555-578). New York: Wiley.

Baxter, M. G., Parker, A., Lindner, C.C.C., Izquierdo, A.D., & Murray, E.A. (2000). Control of response selection by reinforcer value requires interaction of amygdale and orbital prefrontal cortex. *Journal of Neuroscience*, 20, 4322-4319.

Bauminger, N. (2004). The expression and understanding of jealousy in children with Autism. *Development and Psychopathology*, 16(1), 157-177.

- Bellack, A.S. (1983). Recurrent problems in the behavioral assessment of social skills. *Behavioral Research and Therapy*, 21, 29-41.
- Bielecki, J., & Swender, S. (2004). The assessment of social functioning in individuals with mental retardation. *Behavior Modification*, 28(5), 694-708.
- Broks, P., Young, A. W., Maratos, E.J., Coffey, P.J., Calder, A. J., Isaac, C., Mayes, A.R., Hodges, J.R., Montaldi, D., Cezayirli, F., Roberts, N., & Hadley, D. (1998). Face processing impairments after encephalitis: Amygdala damage and recognition of fear. *Neuropsychologia*, 36, 59-70.
- Borod, J.C., Obler, L. K., Erhan, H.M., Grunwald, I. S., Cicero, B.A., Welkowitz, J., et al. (1998). Right hemisphere emotional perception: Evidence across multiple channels. *Neuropsychology*, 12, 446-458.
- Bruce, V., & Young, A. (1986). Understanding face recognition. *British Journal of Psychology*, 77, 305-327.
- Bozikas, V.P., Kosmidis, M. H., Anezoulaki, D., Giannakou, M., & Karavatos, A. (2004). Relationship of affect recognition with psychopathology and cognitive performance in schizophrenia. *Journal of the International Neuropsychological Society*, 10, 549-558.
- Bomba, P.C., & Siqueland, E.R. (1983). The nature and structure of infant form categories. *Journal of Experimental Child Psychology*, 35, 294-328.
- Boucher, J.D., & Carlson, G.E. (1980). Recognition of facial expression in three cultures. *Journal of Cross-Cultural Psychology*, 11, 263-280.
- Bulmer, M. (1987). *Social basis of community care*. London & Boston. Allen & Unwin.
- Caffrey, R., Fuchs, D. (2007). Differences in performance between students with learning disabilities and mild mental retardation: Implications for categorical instruction. *Learning Disabilities Research & Practice*, 22(2), 119-128.
- Calder, A.J., Keane, J., Manly, T., Nimmo-Smith, I., Sprengelmeyer, R., & Young, A. W. (2003). Facial expression recognition across the adult lifespan. *Neuropsychologia*, 41, 195-202.
- Calder, A.J., Young, A.W., Perrett, D.I., Etcoff, N.L., Rowland, D., & Hodges, J.R. (1996). Facial emotion recognition after bilateral amygdala damage: Differentially severe impairment of fear. *Cognitive Neuroscientist*, 5, 201-207.

- Campione, J.C., & Brown, A.L. (1984). Learning ability and transfer propensity as sources of individual differences in intelligence. In P.H. Brooks, R Sperber, & C. McCauley (Eds.) *Learning and cognition in the intellectually disabled* (pp.265-293). Hillsdale, NJ: Erlbaum.
- Cancelliere, A.E.B., &Kertzesz, A. (1990). Lesion Localization in acquired deficits of emotional expression and comprehension. *Brain and Cognition*, 13, 133-147.
- Canli, T., Zhao, Z., Desmond, J., Glover, G., &Gabrieli, J.D.E. (1999). fMRI identifies a network of structures correlated with retention of positive and negative emotional memory. *Psychobiology*, 27, 441-452.
- Carton, J.S., Kessler, E.A., &Pape, C. L. (1999). Nonverbal decoding skills and relationship well-being in adults. *Journal of Nonverbal Behavior*, 23, 91-100.
- Celani, G., Battacchi, M. W., &Arcidiacono, L. (1999). The understanding of the emotional meaning of facial expressions in people with autism. *Journal of autism and Developmental Disorders*, 29(1), 57-66.
- ChadseyRusch J. (1991). Towards defining and measuring social skills in in employment settings. *American Journal on Mental Retardation* 96, 405-418.
- Channon, S., Hedenstrom, A., Lyons, K., Phillips, L.H., &Tunstall, M. (2008). The role of working memory in decoding emotions. *The American Psychological Association*, 8(2), 184-191.
- Christie, F., Bruce, V. (1998). *Memory & cognition*, 26(4), 780-790.
- Consedine, N.S., Magai, C., &Bonanno, G.A.(2002). Moderators of the emotion inhibition-health relationship: A review and research agenda. *Review of General Psychology*, 6, 204-228.
- Coe, D., Matson, J.L., & Fee, V. (1990). Training nonverbal and verbal play skills to mentally retarded and autistic children. *Journal of Autism & Developmental Disorders*, 20, 177-187.
- Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt Brace.
- Darwin, C. (1965). *The expression of the emotions in man and animals* (Rev. ed.). Chicago: The University of Chicago Press.
- Darwin, C. (1872). *The expression of the emotions in man and animals* (3<sup>rd</sup>ed.). New

York : Oxford University Press.

- De Bildt, A., Sytema, S., Kraijer, D., Sparrow, S., & Minderaa, R. (2005). Adaptive functioning and behavior problem in relation to level of education in children and adolescents with intellectual disabilities. *Journal of Intellectual Disability Research, 49(9)*, 672-681.
- Detterman, D. K. (1999). The psychology of mental retardation. *International Review of Psychiatry, 11*, 26- 33.
- Detterman, D.K., & Sternberg, R.J. (1993). (Eds.). *Transfer on trial: Intelligence, cognition, and instruction*. Norwood, NJ: Ablex Publishing.
- Dickson, K. L., Fogel, A., Messinger, D. (1998). The development of emotion from a social process view. In M.F. Mascolo & S. Griffin (Eds.), *What develops in emotional development?* (pp. 253- 271). New York: Plenum Press.
- Dilon, C., & Carr, J.E. (2007). Assessing indices of happiness and unhappiness in individuals with developmental disabilities: A review. *Behavioral Interventions, 22*, 229-244.
- Dykens, E. M. (2006). Toward a Positive Psychology of Mental Retardation. *American Journal of Orthopsychiatry, 76 (2)*, 185-193.
- Eastwood, J.D., Frischn, A., & Smilek, D. (2008). Visual search for faces with emotional expressions. *The American Psychological Association, 134(5)*, 662-676.
- Edgar, E. (1998). Employment as an outcome for mildly handicapped students: Current status and future directions. *Focus on Exceptional Children, 21*, 1-8.
- Ekman, P., Ellsworth, P., & Friesen, W.V. (1972). *Emotion in the human face*. Ellsford, NY: Pergamon.
- Ekman, P., & Friesen, W.V. (1975). *Unmasking the face: A guide to recognizing emotions from facial clues*. Englewood Cliffs, NJ: Prentice Hall.
- Ekman, P. & Friesen, W.V. (1976) *Pictures of Facial Affect*. Palo Alto, CA: Consulting Psychologists Press.
- Ekman, P., & Friesen, W.V. (1982). Felt, false and miserable smiles. *Journal of Nonverbal Behavior, 6(4)*, 238-252.
- Ekman, p., Friessen, W.V., & Ellsworth, P. (1982). What emotion categories or dimensions can observers judge from facial behavior? In P. Ekman (Ed.),

Emotion in the human face.(pp. 39-55). New York: Cambridge University Press.

- Ekman, P., Friesen, W.V. (1995). *Unmasking the face: A guide to recognize emotions from facial clues*. Englewood Cliffs, NJ: Prentice-Hall.
- Ekman, P., Friesen, W. V., & Hager, J .C. (2002). *The facial action coding system (computer software)*.
- Ekman, P. (2003). *Emotions revealed*. New York: Owl Books.
- Ellis, N.R. (1969). A behavioral research strategy in mental retardation: Defense and critique. *American Journal of Mental Deficiency*, 73, 557-566.
- Elfeinbein, H.A., & Ambady, N. (2002). On the universality and cultural specificity of emotion recognition. A meta analysis, *Psychological bulletin*, 128, 203-235.
- Ellsworth, P.C., & Scherer, K.R. (2003). Appraisal processes in emotion. In R.J. Davison, H. Goldsmith, & K.R. Scherer (Eds.). *Handbook of the affective sciences*. New York: Oxford University Press.
- Engelberg, E. & Sjoberg, L. (2004). Emotional intelligence, affect intensity, and social adjustment. *Personality and Individual Differences*, 37, 533-542.
- Eysenck, H. (1993). The biological basis of intelligence. In P.A. Vernon (Ed.). *Biological approaches to the study of human intelligence*. Norwood, NJ: Ablex.
- Farah, M., Wilson, K., Drain, M., & Tanaka, J. (1998). What is special about face perception. *Psychological Review*, 105, 482-498.
- Frith, U., & Frith, C.D. (2003). Development and neurophysiology of mentalizing. *Philosophical Transactions of the Royal Society of London, Series B, Biological Sciences*, 358, 459-473.
- Frith, U., & Hill, E. (2004). *Autism: Mind and brain*. Oxford: Oxford University Press.
- Fischer, K.W., & Bidell, T.R. (1998). Dynamic development of psychological structures in action and thought. In W. Damon (Series ed.) & R.M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol 1. Theoretical models of human development (5<sup>th</sup> ed., pp.467-561)*. New York: Wiley.
- Fisher, G.M., Kilman, B.A., & Shotwell, A.M. (1961). Comparability of intelligence quotients of mental defectives on the Wechsler Adult Intelligence Scale and the 1960 revision of the Stanford-Binet. *Journal of Consulting Psychology*, 25(3), 192-195.

- Frijda, N. (1986). *The emotions*. Cambridge, England: Cambridge University Press
- Frijda, N.H. (2006). *The laws of emotions*. New York : Erlbaum.
- Gaffan, D., Murray, E.A., & Fabre-Thorpe, M. (1993). Interaction of the Amygdala with the frontal lobe in reward memory. *European Journal of Neuroscience*, *5*, 968-975.
- Gepner, B., Deruelle, C., & Grynfeldt, S. (2001). Motion and emotion: A novel approach to the study of face processing by young autistic children. *Journal of Autism and developmental Disorders*, *31*, 37-45.
- Gibson, J.J., & Pick, A.D. Perception of another person's looking behavior. *American Journal of Psychology*, 1963, *76*, 386-394.
- Griffiths, P. (1997). *What emotions really are: The problem of psychological categories*. Chicago, London: University of Chicago Press.
- Gresham, F.M. (2002). Social Skills assessment and instruction for students with emotion and behavioral disorders. In K.L. Lane, F.M. Gresham & T.E. O'Shaughnessy (Eds.), *Interventions for children with or at risk for emotional and behavioral disorders* (p. 242-258). Boston: Allyn & Bacon.
- Greenspan, S. & Schoultz B. (1981). Why mentally retarded adults lose their jobs: Social competence as a factor in work adjustments. *Applied Research in Mental Retardation* *2*, 23-38.
- Grossman, H. (1973). *A manual on terminology and classification in mental retardation* (Rev. ed.). Washington D.C: American Association on Mental Deficiency.
- Guralnick, M.J. (1986). The peer relations of young handicapped and nonhandicapped children. In P.S. Strain, M.J. Guralnick, & H.M. Walker (Eds.), *children's social behavior: development, assessment, and modification*, San Diego, CA: Academic Press.
- Gray, J.M., Fraser, W.L., & Leudar, I. (1983). Recognition of emotion from facial expression in mental handicap. *British Journal of Psychiatry*, *142*, 556-571.
- Gumpel, T., & Wilson, M. (1996). Application of a Rasch analysis to the examination of the perception of facial affect among persons with mental retardation. *Research in Developmental Disabilities*, *17* (2), 161-171.
- Happe, F.G.E. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and

normal children and adults. *Journal of Autism and developmental Disorders*, 24, 129-154.

- Hayes, B.K. (1997). Enhancing generalization in people with a developmental disability: Some lessons from research on concept formation. In A. Marynissen & J. Wagner (Ed), Occasional papers: ASSID Annual conferences, 1994-1996. Sydney, NSW: Association of Psychologists in Developmental Disability Services.
- Hayes, B.K., & Taplin, J.E. (1993b). Developmental differences in the use of prototype and exemplar specific information. *Journal of Experimental Child Psychology*, 55, 329-352.
- Herrmann, M.J., Aranda, D., Ellgring, H., Mueller, T.J., Strik, W.K., Heidrich, A., et al. (2002). Face-specific event related potential in humans is independent from facial expression. *International Journal of Psychophysiology*, 45, 241-244.
- Hochschild, Arlie R. (1975). The sociology of feeling and emotion: Selected possibilities: Feminist perspectives on social life and social science, edited by M. Millman and R. Kantor. New York: Anchor Books, 208-307.
- Hochschild, Arlie R. (1981). Attending to codifying and managing feelings: sex differences in love: In feminist frontiers. Rethinking sex, gender, and society, edited by Laurel Richardson and Verta Taylor. Reading, Mass.: Addison Wesley, 225-262.
- Hupp, S.C., & Mervis, C.B. (1982). Acquisition of basic object categories by severely handicapped children. *Child Development*, 53, 760-767.
- Hobson, R., Ouston, J., & Lee, A. (1989). Naming emotion in faces and voices: Abilities and disabilities in autism and mental retardation. *British Journal of Developmental Psychology*, 7, 237-250.
- Humphreys, K., Minshew, N., Leonard, G.L., & Behrmann, M. (2007). A fine-grained analysis of facial expression processing in high-functioning adults with Autism. *Neuropsychologia*, 45, 685-695.
- Izard, C.E. (1972). *The face of emotion*. New York: Appleton Century-Crofts.
- Iidaka, T., Omori, M., Murata, T., Kosaka, H., Yonekura, Y., Okada, T., & Sadato, N. (2001). Neural interaction of the amygdala with the prefrontal and temporal cortices in the processing of facial expressions as revealed by fMRI. *Journal of Cognitive Neuroscience*, 13(8), 1035-1047.
- Jones, B.C., DeBruine, L. M., Little, A. C., Conway, C. A., & Feinberg, D. R. (2006).

- Integrating gaze direction and expression in preferences for attractive faces. *Psychological Science*, 17, 588-591.
- Jellema, T., & Pecchinenda, A. (2005). The role of theory of mind in affective priming. *Journal of cognitive neuroscience*, 17, 114-115.
- Knight, M.G., Ross, D.E., Taylor, R.L., & Ramasamy, R. (2003). Constant time delay and interpersonal of known items to teach sight words to students with mental retardation and learning disabilities. *Education and Training in Developmental Disabilities*, 38, 179-191.
- Kavale K. A., & Forness S.R. (1996). Social skills deficits and learning disabilities: a meta-analysis. *Journal of Learning Disabilities* 29, 226-237.
- Keenan, J.P., Nelson, A., O'Connor, M., & Pascual-Leone, A. (2001). Self recognition and the right hemisphere. *Nature*, 408, 305.
- Kock, N. (2004). The psychobiological model: Towards a new theory of computer-mediated communication based on Darwinian Evolution. *Organization Science*, 15(3), 327-348.
- Lazarus, R.S. (2006). Emotions and interpersonal relationships: Toward a person-centered conceptualization of emotion and coping. *Journal of Personality*, 9-46.
- Langton, S.R.H., Watt, R.J., & Bruce, V. (2000). Do the eyes have it? Cues to the direction of social attention. *Trends in Cognitive Sciences*, 4, 50-59.
- Lawson, J. (2003). Depth accessibility difficulties: An alternative conceptualisation of autism spectrum conditions. *Journal for the theory of Social Behavior*, 33(2), 189-202.
- Leathers, D.G., & Emigh, T.H. (1980). Decoding facial expressions: A new test with decoding norms. *The Quarterly Journal of Speech*, 66, 418-436.
- Lenz, M., Singh, N.N., & Hewett, A. (1991). Overcorrection as an academic remediation procedure: A reappraisal. *Behavior Modification*, 15, 64-73.
- Levy, L.H., Orr, T.B., & Rosenzweig, S. (1960). Judgments of emotion from facial expressions by college students, mental retardes and mental hospital patients. *Journal of Personality*, 28, 324-349.
- Lewis, M.D. (2000). Emotional self-organization at three time scales. In M.D. Lewis & I. Granic (Eds.), *Emotion, deveopment, and self organization: Dynamic systems approaches to emotional development* (pp. 37-69). Cambridge, England:

Cambridge University Press.

- Lobmaier, J.S., Fischer, M.H., &Schwaninger, A. (2006). Objects capture perceived gaze direction. *Experimental Psychology*, *53*(2), 117-122.
- Macdonald, H., Rutter, M., Howlin, P., Rios, P., Le conteur, A., Evered, C., et al.(1989). Recognition and expression of emotional cues by autistic and normal adults. *Journal of child Psychology and Psychiatry*, *30*, 865-877.
- Mah, L., Arnold, M.C., &Grafman, J. (2004). Impairment of social perception associated with lesions of the prefrontal cortex. *American Journal of Psychiatry*, *161*, 1247-1255.
- Mather, M. &Carstensen, L.L. (2003).Aging and attentional biases for emotional faces. *American Psychological Science*, *14* (5), 409-415.
- Maurer, H., &Newbrough, J.R. (1987). Facial expressions of mentally retarded and nonretarded children: I. Recognition by mentally retarded and nonretarded adults. *American Journal of Mental Deficiency*, *91*, 505-510.
- Mascolo, M.F., & Fischer, K.W.(1995). Developmental transformations in appraisals for pride, shame, and guilt. In J.P. Tangney & K.W. Fischer (Eds.), *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride* (pp. 64-113). New York: Guildford Press.
- Matson, J.L., Zeiss, A.M.Zeiss,R.A., & Bowman, W. (1980). A comparison of social skills training and contingent attention to improve behavioral deficits of chronic psychiatric patients. *British Journal of social and Clinical Psychology*, *19*, 57-64.
- Matson, J.L. &Ollendick, T.H (1988). *Enhancing children's social skills: Assessment and training*. Elmsford, NY: Pergamon.
- Matson, J.L., Fee, V.E., & Coe, D.A. (1991). A social skills program for developmentally delayed preschoolers. *Journal of Clinical Child Psychology*, *20*, 428-433.
- Matson, J.L., &Swiezy, N. (1994).Social skills training with autistic children.In J.L. Matson (Ed.). *Autism in children and adults: Etiology, assessment, and intervention*. (p. 241-260), Belmont, CA: Brooks/Cole Publishing.
- Matson, J.L., Zeiss, A.M., Zeiss,R.A.,&Bowwman,W.(1980). A comparison of social skills training and contingent attention to improve behavioral deficits of chronic psychiatric patients. *British Journal of Social and Clinical Psychology*, *19*, 57-64.
- McAlpine C., Kendall K. A. & Singh N.N. (1991). Recognition of facial expressions of

emotion by persons with mental retardation. *American Journal on Mental Retardation* 96, 29-36.

- McAlpine, C., Singh, N.N., & Ellis, C.R. Kendall, K.A., & Hamton C. (1992). Enhancing the ability of adults with mental retardation to recognize facial expressions of emotion. *Behavior Modification* 16, 559-573.
- McKinnon, M.C., & Moscovitch, M. (2007). Domain-general contributions to social reasonings: Theory of mind and deontic reasoning reexplored. *Cognition*, 102, 179-218.
- McMillan, D.L., Greshan F.M., Siperstein G.N. (1993). Conceptual and psychometric Psychometric consensus about the 1992 AAMR definition of mental retardation. *AM J of mental retardation*, 99, 325-335.
- McClure, E.B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children, and adolescents. *Psychological Bulletin*, 126, 424-453.
- Mendolia, M. (2007). Explicit use of categorical and dimensional strategies to decode facial expressions of emotions. *Journal Nonverbal Behavior*, 31, 57-75.
- Miyake, A., & Shah, P. (1999). Toward unified theories of working memory: Emerging consensus, unresolved theoretical issues, and future research directions. In A.
- Moore, D. G. (2001). Reassessing emotion recognition performance in people with mental retardation: A review. *American Journal on Mental Retardation*, 106, 143-147.
- Narumoto, J., Okada, T., Sadato, N., Fukui, K., & Yonekura, Y. (2001). Attention to emotion modulates fMRI activity in human right superior temporal sulcus. *Cognitive Brain Research*, 12, 225-241.
- Oliver, M. (1990). *The politics of Disablement*. London: Macmillan.
- Owen, A., Browning, M. & Jones, R.S. (2001). Emotion recognition in adults with mild-moderate learning disabilities. *Journal of Learning Disabilities*, 5, 267-281.
- Ozonoff, S., Pennington, B. F., & Rogers, S.J. (1990). Are there emotion perception deficits in young autistic children? *Journal of Child Psychology and Psychiatry*, 31, 343-361.
- Pahl, S., Eiser, J.R. (2005). Valence, comparison focus, and self positivity biases: Does it matter whether people judge positive or negative traits? *Experimental*

- Psychology, 52(4), 303-310.
- Phan, K.L., Wager, T., Taylor, S.F., & Liberzon, I. (2002). Functional neuroanatomy of emotion: a meta-analysis of emotion activation studies in PET and fMRI. *Neuroimaging, 16*, 331-348.
- Parkinson, B. (2005). Do facial movements express emotions or communicate motives? *Personality and social psychology Review, 9*, 278-311.
- Phillips, L. H., & Allen, R. (2004). Adult aging and the perceived intensity of emotions in faces and stories. *Aging: Clinical and Experimental Research, 16*, 190-199.
- Phillips, L. H., Tunstall, M., & Channon, S. (2007). Exploring the role of working memory in dynamic social cue decoding using task methodology. *Journal of Nonverbal Behavior, 31*, 137-152.
- Raymond, K.L., & Matson, J.L. (1989). Social skills in the hearing impaired. *Journal of Clinical Child Psychology, 18*, 247-258.
- Reschly, D.J. (2009). Documenting the developmental origin of mild mental retardation. *Applied Neuropsychology, 16*(2), 124-134.
- Rojahn, J., Rabold D.E., & Schneider F. (1995). Emotion specificity in mental retardation. *American Journal on mental Retardation 99*, 477-486.
- Russell, J. A. (1994). Is there universal recognition of emotion from facial expressions? A review of the cross-cultural studies. *Psychological Bulletin, 115*, 102-141.
- Rudestan, K. E., Newton, R. R. (2001). *Surviving your dissertation: A comprehensive guide to content and process* (2<sup>nd</sup> ed.). Thousand Oaks, California.
- Saarni, C., Campos, J.J., Camras, L. A., & Witherington, D. (2006). Emotional Development: Action, communication, and understanding. In W. Damon & R. M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child Psychology: Vol 3. Social, emotional and personality development* (6<sup>th</sup> ed.), 226-299. New York: Wiley.
- Salomon, G., & Perkins, D.N. (1989). Rocky roads to transfer: Rethinking mechanisms of a neglected phenomenon. *Educational Psychologist, 24*, 113-142.
- Scholck, H., & Squire, L. R. (2001). Impaired perception of facial emotions following bilateral damage to the anterior temporal lobe. *Neuropsychology, 15*, 30-38.
- Sperber, R.D., Ragain, R.D., & McCauley, C. (1976). Reassessment of category

knowledge in intellectually disabled individuals. *American Journal of Mental Deficiency*, 81, 227-234.

- Sperber, R., & McCauley, C. (1984). Semantic processing efficiency in the intellectually disabled. In P.H. Brooks, R. Sperber, & C. McCauley (Eds.) *Learning and cognition in the intellectually disabled* (pp. 141-163). Hillsdale, NJ: Erlbaum.
- Simpson, Murray., K. (1996) Normalization and the psychology of mental retardation. *The editorial Board of the sociological review*, 99-118.
- Sullivan, S., & Ruffman, T. (2004). Emotion recognition deficits in the elderly. *International Journal of Neuroscience*, 114, 403-432.
- Schmidt, K.L., Cohn, J.F. (2001). Human facial expressions as adaptations: Evolutionary questions in facial expression research. *Year book Physical Anthropology*, 44, 3-24.
- Schmolck, H., & Squire, L.R. (2001). Impaired perception of facial emotions following bilateral damage to the anterior temporal lobe. *Neuropsychology*, 15, 30-38.
- Schwaninger, A., Lobmaier, J.S., Fischer, M.H. (2005). The inversion affect on gaze perception reflects processing of component information. *Experimental Brain Research*, 16(1), 49-55.
- Sprengelmeyer, R., Young, A.W., Calder, A.J., Karnat, A., Lange, H., Homberg, V., et al. (1999). Loss of disgust: Perception of faces and emotions in Huntington's disease. *Brain*, 119, 1647- 1665.
- Stewart C. A. & Singh N.N. (1995). Enhancing the recognition and production of facial expressions of *emotion* by children with mental retardation. *Research in Developmental Disabilities* 16, 365-382.
- Symons, L.A., Lee, K., Cedrone, C.C., & Nishimura, M. (2004). What are you looking at? Acuity for triadic eye gaze. *Journal of General Psychology*, 131(4), 451-469.
- Tanaka, J., & Farah, M.J. (1993). Parts and wholes in face recognition. *Quarterly Journal of Experimental Psychology*, 46 A, 225-245.
- Tipples, J., Young, A.W., & Atkinson, A.P. (2002). The eyebrow frown: A salient signal. *Emotion*, 2(3), 288-296.
- Tomkins, S.S. (1984). Affect theory. In: K.R. Scherer, & P. Ekman (Eds), *Approaches to emotion* (pp. 163-195). Mahwah, NJ: Erlbaum.

- Vuilleumier, P., Armony, J.L., Diver, J., & Dolan, R.J. (2003). Distinct spatial frequency sensitivities for processing faces and emotional expressions. *Nature Neuroscience*, 6(6), 624-631.
- Vogeley, K., Bussfeld, P., Newen, A., Herrmann, S., Happe, F., Falkai, P., et al. (2001). Mind reading: Neural mechanisms of theory of mind and Self- perspective. *Neuroimage*, 14, 170-181.
- Vogeley, K., & Fink, g.R. (2003). Neural correlates of the first person perspective. *Trends in cognitive Sciences*, 7, 38-42.
- Vosk, B.N., Forehand, R., & Figueroa, R. (1983). Perception of emotions by accepted and rejected children. *Journal of Behavioral Assessment*, 5, 151-160.
- Waltz, N. C., & Benson, B. A. (1996). Labelling and discrimination of facial expressions by aggressive men with mental retardation. *American Journal on Mental Retardation* 101, 282-293.
- Wellman, H.M. (1993). Early understanding of mind: The normal case. In S. Baron-Cohen, H. Tager-Flusberg, & D.J. Cohen (Eds.), *Understanding other minds: Perspectives from autism* (pp. 10-39). Oxford, England: Oxford University Press.
- Woodcock, K.A., & Rose, J. (2007). The relationship between the recognition of facial expressions and self-reported anger in people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 20, 279-284.
- Whitaker, S. (2001). Anger control for people with learning disabilities: a critical review. *Behavioral and Cognitive Psychotherapy*, 29, 277-293.
- Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*, 9, 11-29.
- Winters, J.J. Jr. (1985). Proactive inhibition in intellectually disabled persons: Some clues to short-term memory processing. In N.R. Ellis & W. Bray (Eds.), *International review of research in intellectual disability*, 13, 279-300. Orlando, FL: Academic Press.
- Witherington, D.C., Campos, J.J., & Hertenstein, M.J. (2001). Principles of emotion and its development. In G. Bremner & A. Fogel (Eds.), *Blackwell handbook of infant development* (pp. 427-464). Oxford, England: Blackwell.
- Witherington, D.C., Crichton, J.A. (2007). Frameworks for Understanding Emotions and Their Development: Functionalist and Dynamic Systems Approaches. *The*

*American Psychological Association, 7(3), 628-637.*

Yin, R.K. (1969). Looking at upside down faces. *Journal of Experimental Psychology, 81, 141-145.*

Yirmiya, N., Erel, O., Shaked, M., & Levi, D.S. (1998). Meta analyses comparing theory of mind abilities of individuals with autism, individuals with mental retardation and normally developing individuals. *The American Psychological Association, 124(3), 283-307.*

Young, A. W., Hellawell, D., & Hay, D.C. (1987). Configural information in face perception. *Perception, 16, 747-759.*

Younger, B. (1990). Infant categorization: Memory for category level and specific item information. *Journal of Experimental Child Psychology, 50, 131-155.*

## Appendix A: Training Program Protocol

### **Procedure**

Each trainee participated in the emotion training program individually at the AHRC. The trainees participated in 5 (1time per week, for five weeks) 20 minute sessions. During the training session the facilitator choose two photographs depicting the same facial expressions then placed them in front of the trainee. For example, for disgust, the facilitator pointed to and traced these facial features with their finger on one of the demonstration photographs. The facilitator then asked the trainee to point to and trace these facial features. During training the facilitator used eight photographs as demonstration photographs.

Training took place in a room at the AHRC workshop. The room had a table and chairs.

A computer program for running the Ekman 60 Faces Test is included on the FEEST CD-ROM, and separate instructions are provided for this software. The faces were presented one at a time for 5 seconds each, followed by a blank screen. The trainee is asked to decide which of the emotion names (anger, disgust, fear, happiness, sadness, and surprise) best describes the facial expression shown. The test yields a score out the maximum of 60 correct for recognition of all six emotions and scores out of 10 for the recognition of each basic emotion. The computer software presented each image in a random order for 5 seconds, records a response by clicking the mouse or touch the screen of the computer. Comparison data are available for 227 individuals aged 20-70 years with IQ of 90 and above.



## Appendix B: HIPPA Compliant PHI Release Form

### Authorization to Use or Disclose PHI for Research Purposes

A copy of the form should be given to the research participant for his/her personal records.

**Discloser of Information:** AHRC

**Recipient of Information:** Juna Michel

**Means of disclosing information** (i.e., verbal, written, etc.): records review

**Information to be disclosed:**

- AHRC records on client's demographics (gender, age)
- Assessments performed as part of the emotion training program (which become part of AHRC records)

**Reason for the Release:** This information is being released/obtained for the purpose of completion of Juna Michel's dissertation

-----

**Authorization Provided by Research Participant:**

I understand that this authorization permits the release of information between the two parties named above.

I understand that I have the right to refuse to sign this release form.

I understand that upon release, this information will be kept confidential; my identity will be concealed and data will not be re-disclosed outside of the specified individuals or agencies.

I understand a photocopy of this release will be as effective as the original.

I understand this authorization will be in effect for 12 months from the date signed unless cancelled by me in writing. Upon receipt of the written cancellation, this release will be void.

---

Client Signature  
(or signature of a Parent/Guardian)

Date

---

Client Name (printed)

---

WITNESS .....

## CURRICULUM VITAE

Juna Michel, M.A, LMHC  
 1227 E 80<sup>th</sup>, Street Unit # 173  
 Brooklyn, NY 11236  
 (347)922-7065 Home  
 (347) 495-7087 Cell

juna.michell@verizon.net

**Academic Experience:**

06/2006-Present

Candidate for Doctor of Philosophy- Clinical Psychology,  
 Walden University Minneapolis, Minnesota  
 Graduate date: 2013

09/1999- 01/2001

Masters of Arts- General Psychology, Pace University  
 New York, NY

06/1999

Bachelor of Arts- Psychology, York College, The City  
 University of New York Jamaica, NY

7/2009-7/2010

**Doctoral Internship AHRC Joseph T Weingold Center**

Conduct adaptive functioning and intelligence testing  
 Participate in interdisciplinary team meetings  
 Participate in functional assessments of behavior and the  
 Development of behavior plans  
 Provide individual counseling  
 Facilitate groups focused on cognitive, behavioral goals  
 such as anger management and socialization, maintain  
 concise and well written case notes, complete assessments  
 in a timely fashion.

**Professional Experience:**

7/2009- Present

**Independent Living Association**

Applied Behavioral Sciences Specialist, Brooklyn, NY  
 Develops and provides psychological services to  
 developmentally disabled adults.  
 Assesses annually individual residents psychological  
 functioning and makes recommendations to IDT.  
 Assesses annually adaptive functioning through the use of  
 standardized materials. Writes reports and participates in  
 each consumer's quarterly review. Develops behavior  
 modification program to address defined individual needs,  
 enhance pro-social behavior, and eliminate maladaptive  
 behavior.

7/2009-Present

Global Communication Services Inc, Lake success, NY  
 Part- time Applied Behavioral Sciences Specialist  
 conducts psychological Testing, individual counseling and  
 intake interview.

- 03/2001- 7/2009                      Psychotherapist, LifespireInc, Brooklyn, NY  
Provide psychological services to program participants. These include individual psychotherapy, family therapy, couple therapy, treatment coordination, and psychological testing. Provide adequate training to staff in the areas of normal growth and development, self-direction, behavior modification, and other topics as assigned.
- 01/2000-01/2001                      Medicaid Service Coordinator, F.E.G.S., New York, NY  
Provided case management, advocacy, and linkage services to adults and their families.
- 9/1999-1/2000                        Behavioral Trainer Intern, The Association for the Help of Retarded Children (AHRC) New York, NY  
Interacted with students and executed daily discrete trial teaching based on Applied Behavioral Analysis approach including the techniques of prompting and reinforcement strategies.

**Licenses and Certification:** Licensed New York, NY Mental Health Counseling