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Nonverbal communication and mental retardation : comprehension and expression of facial affect among adults with developmental disabilities.

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NONVERBAL COMMUNICATION AND MENTAL RETARDATION: COMPREHENSION AND EXPRESSION OF FACIAL AFFECT AMONG ADULTS WITH DEVELOPMENTAL DISABILITIES

A Dissertation Presented

by

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ABSTRACT

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This study investigated the nonverbal affective communication skills of 52 mentally retarded adults as a function of their social competence. The ability to encode and decode posed facial emotional expressions was assessed among a group of peers in a sheltered workshop.

Communication accuracy for facial emotional expressions among the retarded subjects in this sample was similar to the findings reported in other studies involving nonverbal behavioral abilities among non-retarded persons. There was no evidence from self-assessments, peer ratings, or the judgments of nonretarded adults which suggested that retarded individuals express facial affect in an idiosyncratic manner. Across a number of background variables, several correlates of non-verbal communication abilities were found for this sample, including: cognitive ability, work supervisor ratings of interpersonal effective-ness (awareness and interaction with others), age, and a history of

psychiatric disorders. A path analysis was used to trace the implications of the relationships among cognitive ability, nonverbal communication abilities, and social skills; nonverbal affective decoding and encoding abilities did not add to the prediction of general social skills over and above that afforded by cognitive ability.

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		iv
ABSTRACT		v
LIST OF TABLES		ix
LIST OF FIGURES		x
CHAPTER		
I.	INTRODUCTION	1
	Conceptual Definitions of Social Intelligence	1
	Operational Definitions of Social Intelligence	2
	Components of Social Behavior	2
	Nonverbal Communication of Affect	3
	Social Functions of Nonverbal Behavior	4
	Interpreting Facial Affect	6
	Expressing Facial Affect	9
	Nonverbal Social Skills and Mental Retardation	12
II.	NONVERBAL COMMUNICATION AND MENTAL RETARDATION	14
	Social Perception	14
	Facial Affect Recognition and Mental Retardation	15
	Summary	25
	Development of Facial Expressiveness	26
	Nonverbal Encoding Skills and Cognitive Ability	31
	Summary	35
	Measurement Issues	37
	Statement of the Problem	40
	Unanswered or Unasked Questions	41
III.	METHOD	45
	Subjects	45
	Procedures	48
	Encoding	48
	Decoding	50
IV.	RESULTS	53
	Gender Differences	53
	Age Differences	53
	Communication Accuracy	54
	Encoding vs. Decoding Skills	55

Ratings of Familiar and Independent Judges 56
Self-Assessments 57
Nonverbal Communication and Adaptive Functioning . . . 59
Correlates of Nonverbal Skills 61

V. DISCUSSION 67

Gender Differences 67
Age Differences. 69
Communication Accuracy 69
Encoding and Decoding Skills 71
Ratings of Familiar and Independent Judges 71
Self-Assessments 73
Nonverbal Communication and Adaptive Functioning . . . 75
Correlates of Nonverbal Skills 78
Limitations. 79
Facial Appearance. 80
Implications 82
Enhancing Nonverbal Communication Skills 83
Toward the Future. 85

APPENDICES. 88

A. Summary of Studies 89
B. Consent Forms. 93
C. Socialization Scale. 100
D. Practice Item. 103
E. Statistical Tables 105
F. Subject Photos 118

REFERENCE NOTES 122

REFERENCES. 123

LIST OF TABLES

		Page
1.	Studies Investigating the Relationship between Facial Affect Decoding Skill and Cognitive Ability in Mental Retardation.	90
2.	Studies Investigating the Relationship between Facial Affect Encoding Skill and Cognitive Ability in Mental Retardation.	92
3.	Means, Standard Deviations, and t-Test Results for Males and Females on Encoding and Decoding Tests	106
4.	Means, Standard Deviations, and t-Test Results for Peer Decoding Accuracy of Specific Emotional Expressions.	107
5.	Number and Percent of Subjects with Each Possible Pose or Pose Combination Correct	108
6.	Means, Standard Deviations, Correlation Coefficients, and t-Test Results on Encoding and Decoding Tasks.	109
7.	Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Ratings of Familiar and Independent Judges	110
8.	Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Affect Identification Scores for Retarded and Nonretarded Raters	111
9.	Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Immediate and Delayed Self-Assessments. .	112
10.	Means, Standard Deviations, and t-Test Results for Self-Assessment and Encoding Scores Assigned by Peers	113
11.	Means, Standard Deviations, and t-Test Results for Nonverbal Communication Abilities and Adaptive Functioning	114
12.	Descriptive Statistics and Multivariate/Univariate Analyses of Variance for Measures of Cognitive Ability, Social Skills, Nonverbal Communication Abilities, and Age for Subjects According to Psychiatric History	115
13.	Matrix of Standardized Regression Coefficients for Nonverbal Communication Variables.	116
14	Decomposition of Bivariate Relationships	117

LIST OF FIGURES

		Page
1.	Path Analysis.	65
2.	Photos of Subjects Who Successfully Posed the Requested Facial Expressions	119
3.	Photos of Subject Unable to Pose Requested Facial Expressions.	120
4.	Photos of Subject Unable to Pose Requested Facial Expressions.	121

CHAPTER I

INTRODUCTION

In a best selling novel, John Fowles (1969) described an important ability:

> Sarah was intelligent, but her real intelligence belonged to a rare kind; one that would certainly pass undetected in any of our modern tests of the faculty. It was not in the least analytical or problem-solving, and it is no doubt symptomatic that the one subject that had cost her agonies to master was mathematics. Nor did it manifest itself in the form of any particular vivacity or wit, even in her happier days. It was rather uncanny --- uncanny in one who had never been to London, never mixed in the world --- ability to classify other people's worth: to understand them, in the fullest sense of that word (p.61).

As Fowles observed, social intelligence has been difficult to test.

Conceptual Definitions of Social Intelligence

In 1920, E.L. Thorndike distinguished social intelligence from two other types of human intelligence: abstract and mechanical, while acknowledging that measuring social intelligence is difficult because "It requires human beings to respond to, time to adapt its responses, and face, voice, gesture, and mien as tools" (p.231). More recently, Chandler (1977) argued that the apparently distinct facets of intelligence may actually represent only superficial differences in the content of social and nonsocial tasks which obscure their essential similarities. On the other hand, Damon (1979) discussed the unique properties of social knowledge, i.e., communication with others, which distinguishes social from physical events and requires a special sort of cognitive development. Perhaps the problems defining, recording,

and evaluating social behavior, has resulted in the study of social intelligence lagging behind studies of physical cognition. Whether social, abstract, and mechanical intelligence are in fact, distinct, remains a question today.

Operational Definitions of Social Intelligence

Thorndike's original definition of social intelligence included the idea of the ability to: 1. understand others and 2. act or behave wisely in relating to others. From the first perspective, social intelligence is exemplified by skills which involve interpreting social information. The second criterion is concerned with the effectiveness of social performance.

Variously termed "social competence," "social skills," "social awareness," "social sensitivity," or "interpersonal effectiveness," social intelligence generally refers to the cognitive and behavioral skills that are involved in interpersonal interactions. Weinstein (1969) defined social competence as:

> . . . the ability to accomplish interpersonal tasks. This is no more than saying that interpersonal competence boils down to the ability to manipulate others' responses. . . . Competence is relative to the actor's purpose (p.755).

Social interaction involves communication. Weinstein's definition emphasizes the pragmatics of communication to influence the behavior of others.

Components of Social Behavior

Zigler's work (Zigler & Levine, 1973; Zigler & Phillips, 1961) which indicated a relationship between social competence and psychological adjustment, suggesting that poor social functioning could lead to

psychopathology rather than resulting from it, is frequently cited as having been the impetus for research concerned with the components of social behavior.

Effective interpersonal relationships depend on the ability to go beyond what is said in order to understand the unspoken feelings and motivations of others. Social skills are comprised of both verbal and nonverbal behaviors. A great deal of information is conveyed by means of nonverbal behavior which may qualify the meaning of verbal messages (Watzlawick, Bavalas, & Jackson, 1967). For instance, facial affect is an important social cue that can be used to clarify ambiguous verbal statements. Watson (1972) found that facial expression had a greater impact than verbal content in communicating emotional states.

Nonverbal Communication of Affect

In his seminal work on facial expressiveness, Darwin (1872/1965) suggested that facial affect was universal and biologically determined --- a product of evolution. Facial behavior has had survival value for humans. Ekman and Friesen (1975) reviewed cross-cultural evidence of the universality of distinctive facial appearances for the primary emotions of surprise, fear, disgust, anger, happiness, and sadness. Cultures differ in terms of what might elicit a particular emotion as well as in the display rules for managing facial expressivity under various social circumstances.

Rules for displaying emotion are apparently learned early in life. Cognitive and social learning variables play a role in the development of skills in recognizing and expressing facial affect as explained by Tomkins and McCarter (1964):

> If parents unduly punish the facial expression of affect or any particular facial affect, then this source of information may be lost to the individual as a guide to the perception of the same expression in others. Or he may be sensitized to its expression in others but defend himself against this perception in others as he has been forced to defend himself against the affect in himself. Thus, he may avoid looking at a face which is in anger or in excitement, or he may avoid friendship or contact with individuals with vivacious facial expressiveness.
>
> Just as the interpretation of facial expressiveness of the other may be impaired by impairment of one's facial expression, so the latter may also be impaired by parents or other models whose facial expressiveness has itself been inhibited, or who provide insufficient interaction . . . there is the absence of affective stimulation, negative sanctions for what is regarded as too excessive emotional display, and frequently a gross reduction in interpersonal communication . . . there tends to be a circular reinforcement between parents and their children which accelerates the skill in interpreting both one's own and the other's facial expressiveness or which decelerates or blocks the acquisition of this skill . . . the skills of receiving and sending are intimately interdependent because the face one sees is not so different from the face one lives behind (pp.127-128).

Social Functions of Nonverbal Behavior

There are two aspects of nonverbal communication: 1. sensitivity or decoding, and 2. expressivity or encoding. Nonverbal decoding refers to the capacity to understand the emotions conveyed through others' non-verbal behavior. Nonverbal encoding is the ability to express emotions through nonverbal cues, such as facial expressions.

The human face is a highly visible and powerful source of information. It indicates something about a person's age, gender, race, health, and emotional state. Frequently, inferences are made about personality and intelligence from the face. Facial expressiveness is

employed during interpersonal interactions to achieve specific goals. Accurate observations (decoding) as well as effective performances (encoding) are necessary for intelligent social behavior. Because nonverbal behavior serves social or communicative functions, nonverbal skill deficits may negatively influence the quality of an individual's interpersonal functioning.

There is evidence pointing to a relationship between nonverbal skills and general social functioning. Christensen, Farina, and Boudreau (1980) have indicated that sensitivity to nonverbal uses is an important component of social competence. In their study, socially unskilled persons were less responsive to the nonverbal signs of distress in other persons than were subjects who had been judged socially adept by their peers. Focusing on doctor-patient interactions, DiMatteo, Hays, and Prince (1986) reported relationships between a physician's nonverbal communication skills and several measures of patient satisfaction. Among preschool-aged children, the findings of Zuckerman and Przewuzman (1979) raise the possibility that proficiency in decoding and encoding facial expressions of emotion might serve as an index of overall social adjustment.

Social skills deficits represent a significant issue for mentally retarded individuals. The definition of mental retardation proposed by the American Association on Mental Deficiency (Grossman, 1983) and adopted in the classification systems of both the Diagnostic and Statistical Manual of Mental Disorders and the International Classification of Diseases, addresses social dysfunction:

> Mental retardation refers to significantly sub-average general intellectual functioning existing

> concurrently with deficits in adaptive behavior and manifested during the developmental period.

Adaptive behavior has been further defined as:

> . . . the effectiveness or degree with which individuals meet the standards of personal independence and social responsibility expected for age and cultural group (p.1).

Interpreting Facial Affect

In social situations, one needs to be able to recognize the facial expressions of another in order to assess the correct message. Developmental studies have shown that infants begin discriminating emotions at 3 or 4 months (LaBarbera, Izard, Vietze, & Parisi, 1976), and by the age of 9 or 10 years, a child's performance is comparable to that of an adult (Ekman & Oster, 1979). Hall (1978) reviewed 75 studies and found that, in general, females were reported to be better decoders of nonverbal information than males.

The right side of the brain, specifically portions of the right temporal cortex, is apparently involved in processing paralinguistic aspects of communication. Benowitz, Bear, Rosenthal, Mesulam, Zaidel, and Sperry (1983) reported that adult patients with right hemisphere brain lesions were unable to evaluate facial expressions of emotion as compared to the performance of normals and subjects with left hemisphere lesions. The authors find support for the hypothesis originally set forth by Darwin in 1872, and conclude that "Given the significance of facial expressions for the social communication of affect, for mother-infant interactions, and for regulating social relations, it is perhaps not surprising that competence in this domain may be specified by our neurology . . ." (p.10).

Victims of violent behavior as well as victimizers have been shown to be deficient in assessing nonverbal cues. Problems with the recognition of emotion as manifested by facial expression may contribute to the oft-reported social and emotional impairments found among children who have been abused or neglected (Camras, Grow, & Ribordy, 1983). Austin (1985) also suggests that the inability of delinquents to recognize facial affect contributes to aggressiveness and undersocialization. Victims of rape demonstrated decreased ability to interpret nonverbal facial cues in a study conducted by Giannini, Price, and Kniepple (1987).

Children considered to be emotionally disturbed were less proficient in identifying emotions from facial expressions than those not considered to be disturbed in a study by Zabel (1979). Walker (1981) also found that schizophrenic and anxious/depressed children were less adept than normals in their emotion recognition accuracy.

Hobson (1986) and Weeks and Hobson (1987) presented results indicating that autistic children were generally insensitive to other people's facial expressions. The avoidant eye gaze characteristic of many autistic children probably contributes to their inability to discriminate facial expressions and to establish an interaction. Feingold (1986) reported that retarded boys had less difficulty discriminating facial expressions than did autistic boys.

Adolescents and children with learning disabilities often exhibit deficiencies in social perception. Research has shown that learning disabled students have difficulty perceiving and interpreting the affective cues of others (Bryan, 1977; Emery, 1975; Wiig & Harris, 1974; Wilchesky, 1980). The social difficulties experienced by many

learning disabled children may not be only a reaction to school failure, but a perceptual problem which hinders their social interactions.

Stickle and Pellegreno (1986) examined the role of individual differences in cognitive style as a factor in labeling facial emotions. The expectation was that field-dependent persons would acquire more social information and be more skilled than field-independent individuals in decoding facial affect after participating in a training program. When IQ was controlled, there was no difference in the post-test scores on affect labeling tasks for the field-dependent and field-independent subjects.

Among individuals who have been classified as mentally retarded, several studies (e.g., Gray, Fraser, & Leudar, 1983; Iacobbo, 1977; Lambert & Defays, 1978; Maurer & Newbrough, 1987a; Meikamp, 1984; Putnam, 1979; Reeves, 1985) have indicated that retarded persons are less able than nonretarded individuals in identifying facial emotional expressions and that this skill varies as a function of level of retardation.

From the aforementioned studies, it is not clear whether problems in decoding facial affect are the cause or consequence of the various disabilities listed.

Notable about the research concerning the interpretation of facial expressions is the finding that some clinical populations do not show deficits in reading nonverbal cues. One nonpsychotic, psychiatric group of children described as unsocialized/aggressive showed no impairment in their level of emotion recognition accuracy relative to normals in a study reported by Walker (1981). Moreover, Giannini et al

(1987) cite evidence of enhanced ability to perceive nonverbal messages among some socially deviant groups, such as rapists, alcoholics, and cocaine abusers, and the authors suggest that this heightened social awareness may be used to exploit others.

Expressing Facial Affect

According to Thorndike (1920), social intelligence means ". . . the ability to understand and manage men and women, boys and girls —— to act wisely in human relations" (p.228). Intelligent social behavior consists of both cognitive (understanding) and behavioral (performance) components. However, Walker and Foley (1973) pointed out that those two aspects are often equated in appropriately. Although social understanding may be necessary for wise social action, it is not a sufficient cause for intelligent social behavior. Clear communication of emotional states is important in serving one's needs by sending accurate messages in order to obtain the desired responses from others.

Individuals have been found to differ both in their ability to decode or interpret the facial affect of others and in their ability to encode or display facial emotion. Odom and Lemond (1972) indicated that children can comprehend others' facial affect before they can accurately produce the emotional expression themselves. Some studies report a weak negative or no relationship between the two abilities as they occur within the same person (Zuckerman, DeFrank, Hall, & Rosenthal, 1976; Zuckerman, Lipets, Koivumaki, & Rosenthal, 1975). Lanzetta and Kleck (1970) obtained a strong negative correlation between decoding and encoding abilities, that is, subjects in their

study who were quite sensitive in perceiving effect in others proved to be relatively inexpressive senders.

Accuracy in communicating feelings is an important component of social interaction. Research suggests that infants as young as 3 to 4 weeks of age possess a basic repertoire of facial behavior which appears to be associated with emotional states (e.g., Oster, 1978). Studies of the spontaneous facial expressions produced by deaf-blind children (Eibl-Eibesfeldt, 1974; Goodenough, 1932) revealed many similarities with sighted children, and are taken as evidence for the role of innate influences on the development of facial expressions. Lewis, Sullivan, and Vasen (1987) showed that a child's voluntary management of facial behavior, the ability to pose emotional expressions, increased between the ages of 2 and 5 years. Zuckerman and Przewuzman (1979) reported that, unlike girls, older boys were less accurate than younger boys in producing facial affect, a finding which suggests that males may be discouraged from developing encoding skills.

Facial expressiveness may influence judgments about personality which engender expectations about behavior so that the expected reactions are reinforced and stabilized. It appears that there are individual differences in the ability to communicate affect via facial expression. Buck has studied the relationship between the ability to communicate affective states nonverbally and some personality variables among preschoolers (1975; 1977) and undergraduates (Buck, Miller, & Caul, 1974; Buck, Miller, Savin, & Caul, 1972). In preschool-age children, "sending" accuracy was positively correlated with teacher assessments of activity level, aggressiveness, impulsiveness, bossiness, sociability, and extraversion, and negatively related to shyness,

cooperation, emotional inhibition, control, and introversion. Similarly, undergraduates who were classified as "internalizers," which is associated with greater introversion, were less able to nonverbally communicate affect than those students categorized as "externalizers." In general, females have been shown to be more accurate senders than males in these studies.

Expressive inaccuracy may contribute to personal adjustment problems. Feldman, White, and Lobato (1982) demonstrated a relationship between decreased abilities in nonverbal decoding and encoding of facial affect and emotional disturbance among adolescent males. Depressed patients were significantly impaired in the production of emotional facial expressions, particularly for positive ones, in a study reported by Jaeger, Borod, and Peselow (1986). Among schizophrenic patients, Ellgring (1986) found a tendency for nonverbal behavior and verbal communication to be disassociated, whereas for a comparison group of normal subjects, there was a very close association of facial expression and verbal communication.

With regard to the affective encoding abilities of mentally retarded persons, Cicchetti and Sroufe (1976) have presented some preliminary evidence that infants with Down Syndrome manifest less intense emotional expressions (e.g., crying and social smiling) than normal infants of similar age, which may interfere with early parent-child interactions and the subsequent development of social skills. In a series of studies, Maurer and Newbrough (1987a; 1987b) found that the facial emotional expressions of retarded children were less accurately identified than those of their nonretarded counterparts by retarded and nonretarded adults. The role of emotions in the life of a retarded

person may be underestimated if feelings are not clearly communicated through facial expressions. To determine competence in nonverbal communication, skills of sending as well as receiving need to be assessed.

Nonverbal Social Skills and Mental Retardation

There seems to be considerable evidence of a relation between nonverbal skills and interpersonal effectiveness. Lack of social skills may have serious implications for maladjustment in adulthood. Retarded individuals often lose their jobs because they violate the personal-social rules associated with work. Among mentally retarded adults, Greenspan and Shoultz (1981) indicate that social incompetence, i.e., deficits in temperament, character, and social awareness, plays at least as important a role in explaining job failures as do nonsocial reasons (health problems, production inefficiency, and economic layoff), and that interpersonally inept behavior (low social awareness) rather than emotionally disturbed or antisocial behavior, appears to be the most frequent factor operating for those mentally retarded workers who are terminated because of social incompetence.

MacDonald (1975) has recommended that a functional analysis of inappropriate social behavior must consider the possibility of inadequate stimulus discrimination and specific skill deficits. Cognitive and behavioral deficiencies in nonverbal communication skills would require a different emphasis in treatment interventions.

Adequate social skills are often identified as a major behavioral deficit for individuals who have been classified as mentally retarded, and in fact, social incompetence is a defining characteristic of

mental retardation (Grossman, 1983). Assessment of social competence has usually emphasized self-help skills or occupational adjustment while social interaction and communication among this population has been largely neglected (Simeonsson, Monson, & Blacher, 1984).

Prejudice towards handicapped individuals exists in our society. Tolerance for some of the social problems of retarded persons would seem to be a reasonable expectation. Nevertheless, it is important to assess how a retarded person may be contributing to his or her own rejection and to identify those abilities that might enhance social functioning.

CHAPTER II

NONVERBAL COMMUNICATION AND MENTAL RETARDATION

Social Perception

Social intelligence depends, in part, on the ability to accurately perceive the social conditions that one encounters. Emotional expressions are a significant social cue and therefore, interpreting the facial affect of others is an important aspect of social intelligence.

Gates (1923) provided evidence that social perception, involving reading facial emotional expressions, improves with age: using a 50% criterion, joy was accurately interpreted by 3 year olds; pain was correctly reported by children 6 years of age; anger was identified by 7 year olds; fear was perceived at age 10 years; and surprise was recognized by 11 year olds in the sample. Those preliminary findings concerning the development of social perception have been supported in more recent studies (e.g., Odom & Lemond, 1972; Shields & Padawer, 1983; Zuckerman & Przewuzman, 1979).

Since Gates (1925) reported a weak positive correlation between skill at identifying facial expressions of emotion and mental age (.12), questions have been raised about the significance of nonverbal decoding skill and its relationship to cognitive ability. Halberstadt and Hall (1980) examined 22 studies, involving primarily nonretarded populations, which tested the relationship between nonverbal understanding and general cognitive ability. To measure nonverbal decoding skills, tasks requiring the recognition of emotional expression through face, voice, and body conveyed via photographs, audiotapes, or videotapes, have been used. Cognitive ability has been defined as mental age, IQ scores, and

educational achievement. Results of their review indicated a small, positive correlation (median = .18). The size of the relationship suggests that level of general intelligence, as it is typically defined, does not account for a large part of the performance on tests of interpreting nonverbal behavior. Correlations between cognitive and nonverbal skills were reportedly strongest among groups with below average intellectual or test taking abilities.

Nonverbal decoding skills may influence subjective appraisals of intelligence. Halberstadt and Hall (1980) also presented findings which imply that skill in reading nonverbal cues may contribute to teacher evaluations of cognitive ability. When IQ scores were controlled, teacher assessments of their students' academic ability were substantially correlated with nonverbal decoding skills. The capacity to recognize another person's feelings might lead others to perceive one as insightful and competent, or as Halberstadt and Hall said it". . . one who gets the message." Relationships between cognitive abilities and nonverbal decoding skills are not simple.

Facial Affect Recognition and Mental Retardation

Several studies have assessed facial affect recognition skills among persons who have been identified as mentally retarded (see Table 1, Appendix A).

Levy, Orr, and Rosenzweig (1960) sought to define those perceptual tasks in which personality factors are major determinants. The authors presumed that intellectual status in the case of mentally retarded persons and emotional status in the case of mental hospital patients would affect their social perception and consequently, their judgments

of emotion from facial expression. Three groups were compared: 96 college students, 61 mentally retarded males, and 50 male mental hospital patients, in terms of their ability to judge emotion along a dimension of happiness - unhappiness from a set of 48 photographs.

On the single happiness - unhappiness dimension of emotion, there was virtually complete agreement among the 3 groups in their median judgments of the affect displayed in the photographs with reported correlations ranging from .97 to .99. The authors suggest that judging facial expression may be a basic skill which is insensitive to intellectual or emotional factors. However, there was a greater range evident in the judgments obtained on the happy - unhappy rating scale for the clinical groups as compared to the normal group.

The purpose of Iacobbo's (1977) dissertation was to study the development of the recognition of affect from facial expressions, with and without a situational context, in relation to age and intelligence as defined by IQ score. In addition, the effects of institutionalization were examined.

The sample included 218 subjects from 7 to 89 years of age. Of that total, there were equal numbers of males and females with 102 individuals classified as retarded and 116 as nonretarded. Retarded subjects had IQ scores ranging from 49 to 84. Two experimental tasks were administered: task 1 assessed emotion recognition by means of picture matching on the basis of facial features and task 2 assessed affect recognition within a context provided by a drawing of an emotion-laden situation.

Preliminary analyses did not reveal significant effects for gender. The mean number of accurate responses from the nonretarded subjects

were significantly greater than the retarded subjects' scores for both task 1 and 2. The error patterns among the retarded subjects showed greater confusion than those of the nonretarded subjects, that is, the retarded subjects' errors for individual emotions were more evenly distributed among the five emotions whereas the nonretarded subjects' errors were more highly concentrated within one emotion category. However, the most common errors of the two IQ groups were qualitatively similar; both groups most frequently mistook sadness for anger, fear for disgust, surprise for fear, and fear for surprise. For all subjects, scores were generally lower on task 2, which required that a facial expression be matched according to the affective content of a picture than on task 1, which involved matching facial expressions. Retarded subjects who had been institutionalized as well as those without such a history, performed best on task 1, though the noninstitutionalized group scored significantly higher; task 2 performances were similar. The nonretarded groups' scores increased with age on both tasks while the retarded subjects' scores improved with age on task 2 only, increasing during childhood but decreasing at adulthood. Other results suggest that among nonretarded individuals participating in this study, recognition accuracy for facial expressions of emotion, within and without a situational context, increased from childhood to adolescence to adulthood but at senescence, dropped to a level typical of a child. Although they were generally as accurate as young children, the older adults were less confused across emotional categories when they erred. The order of difficulty in recognizing emotions on tasks 1 and 2 were similar for the 4 nonretarded age groups, suggesting that some emotions may be more difficult

to recognize than others. Iacobbo (1977) concludes that age and intelligence as indexed by IQ as well as the complex nature of emotions are differentially related to the development of emotion recognition based on facial and contextual information.

Lambert and Defays (1978) at the University of Liege, Belgium, studied the comprehension of facial expressions in 2 groups of 30 retarded and 30 nonretarded children using comic strips and photographs. The same order of recognition for different emotions was found for the two groups (happy, angry, sad, frightened, and surprised). In both groups, mental age was directly related to the number of correctly identified facial expressions. Differences between the groups were reported according to the mode of presentation: the retarded children were better in recognizing facial affect from photographs whereas the nonretarded children were better with the cartoon drawings.

Putnam's dissertation (1979) was an investigation of the extent to which educable mentally retarded children could correctly label and recognize pictures of facial affect. The sample included 111 children (25 White males; 27 White females; 32 Black males; 27 Black females) between the ages of 5 years and 14 years, 7 months with IQ scores ranging from 50 to 75. Fourteen slides representing six emotions (happiness, sadness, fear, anger, disgust, surprise) as well as a neutral expression posed by a male and a female model were selected from a standardized series, the Pictures of Facial Affect (Ekman & Friesen, 1976). For the affect labeling task, the subject was asked to name the feeling depicted. The affect recognition task required that the subject identify the correct facial expression out of three

possibilities which corresponded to the emotion named and described by the experimenter.

Significant correlations were reported for age and IQ scores with the dependent variables: scores on facial affect labeling and recognition tests. On average, older children obtained higher scores on both affect labeling and recognition tasks than did younger children. Children with higher IQ scores also did better on both tasks. The performance of males and females was similar on the recognition task, but males obtained higher scores in labeling emotional expressions. There were no significant differences between the two racial groups on either test.

Gray, Fraser, and Leudar (1983) sought to determine how well mentally retarded people interpret facial expressions of emotion at different levels of handicap and what types of confusions among emotions are made. Twenty-six adults attending day training programs in Fife Region, Scotland, participated in the study. Half of the subjects were classified as mildly retarded (IQ range: 55-87; Mean: 69) and the others were considered severely retarded (IQ range: 41-53; Mean: 48). Following a training period, brief descriptive stories were read to each subject whose task was to choose a picture of the facial expression which matched the emotions labeled in the vignette. Subjects were tested individually on four out of six randomly selected sets of black and white photographs depicting six facial expressions of emotions: joy, sadness, surprise, fear, anger, and disgust.

Results were analyzed with reference to overall performance, performance on individual emotions, and systematic patterns of confusions. The authors also refer to Schlosberg's (1954) notions of the underlying

dimensional structures of emotion, including: evaluation of the stimulus in terms of pleasantness/unpleasantness; intensity or the degree of activation engendered by the stimulus (low: joy, sadness, disgust; high: fear, anger, surprise); and attention, being affected by the stimulus willingly or forcibly (joy, fear) or rejection, being repulsed by the stimulus as in disgust or destroying it as in anger.

Overall, the ability to select the appropriate photographs across all emotions and for each affect considered separately was correlated with intelligence. Happiness was the most easily identified emotional expression while the most common confusions for both groups were: 1. anger and fear; 2. surprise and fear; 3. sadness and anger. Among the severely retarded group, the largest single confusion was surprise and happiness followed by anger and disgust. Performances along the pleasant/unpleasant dimensions were more accurate than for high intensity or rejecting emotions for all subjects. The patterns of confusions found in this work were discussed with reference to data available on normal subjects reported by other authors. Similar misinterpretations of facial expressions were evident for the nonretarded and retarded groups, with the notable exceptions of anger and fear which were poorly recognized and often confused with disgust or surprise by the mentally retarded persons in the Gray et al study. According to Schlosberg's dimensional structures, the mentally retarded individuals performed about the same as nonretarded groups on the pleasant/unpleasant dimension which is consistent with the findings reported by Levy et al (1960), but they were less able with respect to the dimensions of intensity and rejection.

This study demonstrated that the persons in the sample who scored lower on IQ tests also had comparatively greater difficulty recognizing facial expressions of emotion from photographs in response to a verbal label. It is unclear whether the patterns of confusions and discrepancies between nonretarded and retarded groups are due to lexical or task specific factors in the Gray et al study or represent actual differences in emotional perception. A finding with clinical implications was the inability of the retarded subjects to deal with high intensity emotions.

In a dissertation study, Meikamp (1984) investigated differences between children classified as mildly retarded and their peers of average intelligence in terms of their ability to decode facial expressions of emotion. Within each group, aggressive and withdrawn children were also compared. Aggression and withdrawal were presumed to be sources of variation in social competence that were thought to be associated with differences in decoding abilities.

Subjects were elementary and junior high school students; 83 were categorized as mildly retarded and 120 were considered to be of average intelligence per school records. Teacher nominations were used to identify the students who were most aggressive and most withdrawn. Among the subjects with mental handicaps, 20 were then classified as aggressive and 19 as withdrawn. From the group with average intellectual abilities, 14 were in the most aggressive and 21 were in the most withdrawn ranges. Decoding accuracy was assessed via 36 sets of triads of photographs selected from the Pictures of Facial Affect (Ekman & Friesen, 1976) with accompanying vignettes to represent each of six

facial expression categories: happiness, sadness, fear, anger, disgust and surprise. The task for each subject was to identify the picture that matched the emotion described and labeled in the story.

The results indicated that students of average intellectual abilities were more accurate in reading facial affect than students functioning in the mild range of retardation. But the withdrawn and aggressive average ability groups did not differ significantly in their skills of decoding facial expressions nor did the withdrawn and aggressive subgroups of mentally handicapped students. In this study, intelligence level was a better predictor of nonverbal decoding accuracy than were teacher opinions of their students' behavior as aggressive or withdrawn.

Reeves' (1985) dissertation study was an attempt to determine how accurately mentally retarded adults could decode the affective facial cues of others. Subjects were 10 moderately and 16 mildly retarded adult males with a 6 month history of maladaptive, socially inappropriate behaviors manifested in the form of tantrums, physical aggression, or destructiveness. Ten moderately and 12 mildly retarded adult males who met the criterion for social adaptivity of a 1 year history of appropriate interaction with others, were also included. All subjects were rated on the social scales of the AAMD Adaptive Behavior Scales by professionals who were familiar with them. To evaluate sensitivity to facial affect, selected photographs from the Pictures of Facial Affect (Ekman & Friesen, 1976) were randomly presented for both a labeling and recognition task; two independent judges scored the responses.

There was no significant difference between age groups established by a median split. A significant main effect was obtained for level of retardation and four of the six primary emotions: sadness, anger, fear, and disgust, with mildly retarded subjects scoring higher than moderately retarded adults. Total labeling scores were also significantly lower for the moderately retarded group as compared to the mildly retarded subjects. No differences were found between the socially adaptive and maladaptive groups at either level of retardation for affect labeling or recognition. For both moderately and mildly retarded subjects, correct responses to each affective stimulus picture in the recognition condition exceeded chance expectations. Happiness was correctly labeled in significantly more trials than disgust, surprise, sadness, fear, and anger. With the exception of the emotion happy, affective states were identified at different rates depending upon the mode of response which was required; the labeling condition proved to be more difficult than the recognition condition.

Sogon and Izard (1985) conducted three experiments to compare the ability of mentally retarded and nonretarded children to recognize facial emotional expressions and to determine which emotions were easily identified by retarded children. Subjects were 22 Kindergarten children (CA: 6 years, 3 months), 30 second grade school children (CA: 9 years, 2 months), and 12 institutionalized retarded children (CA: 16 years, 7 months; MA: 9 years, 6 months). All subjects were Japanese.

In judging eight facial expressions of acceptance, surprise, fear, sorrow, disgust, anticipation, anger, and joy, posed by a Caucasian model, the retarded group showed a lower overall percentage of correct identifications than the Kindergarten group, except for anger and joy

where they showed higher accurate identifications than the two non-retarded groups. Compared to other findings regarding emotion recognition with Japanese models, the authors report that the percent of correct judgments was lower in this study where the Japanese children were asked to judge Caucasian actors. Retarded children also showed longer response latencies than the nonretarded groups, with the exception of surprise and anger. The authors also report that across all groups, females showed somewhat better emotion recognition than male children.

In a dissertation (1986), Shoup-Thorson investigated the accuracy and speed with which 64 mentally retarded young adults judged pleasant vs. unpleasant facial expressions. Mildly retarded subjects had significantly shorter response latencies than subjects who were moderately retarded. It was also reported that subjects responded faster to female than to male faces when making their judgments. In terms of accuracy, the subjects were more accurate in judging facial affect of males vs. females and in assessing pleasant as opposed to unpleasant emotional expressions.

As part of a recent study conducted by Maurer and Newbrough (1987a), 32 mentally retarded adults viewed a set of 32 slides of 4 retarded and 4 nonretarded preschool-aged children, showing happiness, anger, sadness, and a neutral facial expression. Results were that retarded adults recognized fewer facial expressions than did non-retarded adults.

Summary

Modest correlations have been obtained between cognitive ability and nonverbal understanding for some nonretarded populations (e.g., Gates, 1925; Halberstadt & Hall, 1980). Cognitive ability has usually been defined in terms of "IQ," which is a global construct with many correlates, so that the meaning of the reported relationships is unclear. Presumably, insensitivity to nonverbal social cues stems from low intelligence, but the assessment of intelligence itself, may be influenced by the perceived competence of the subject in decoding nonverbal information.

For retarded populations, studies reviewed from 1960 to the present, have generally found that persons who obtain low scores on IQ tests also perform poorly on facial affect recognition tasks (Gray et al, 1983; Iacobbo, 1977; Lambert & Defays, 1978; Maurer & Newbrough, 1987a; Meikamp, 1984; Putnam, 1979; Reeves, 1985; Shoup-Thorson, 1986; Sogon & Izard, 1985). Those findings are compatible with the definition of mental retardation, but are not informative as to the social/emotional aspects of retardation. For example, when subjects are matched according to their mental ages, what accounts for the poorer performance on facial affect recognition tests by persons who have been classified as mentally retarded?

While the obtained correlations may justify the use of an IQ score as an aid to prediction, it cannot be the only basis of decisions about the social sensitivity of retarded persons. Zigler and Balla (1982) point out that there has been a tendency to over-emphasize intelligence as the critical factor in life adjustment. It is important to note that many retarded individuals are quite socially responsive.

Levy et al (1960) did not find differences in the overall performance of retarded subjects compared to mental hospital patients or college students. This finding is noteworthy because invariance is generally not expected across clinical populations. However, there was greater variability in the scores on affect identification tests for the two clinical groups in this study. Although the retarded subjects studied by Sogon and Izard (1985) scored lower on affect recognition tasks than their nonretarded counterparts, they were more accurate than the comparison groups on two out of the eight emotional expressions tested. This variability suggests that retarded persons may be more heterogeneous than nonretarded groups with respect to the nonverbal decoding abilities required to identify facial affect. Generalizations from group findings to the individual would be less likely to be valid in the case of abnormality than for relative normality.

Development of Facial Expressiveness

Studies concerning the development of the ability to express facial affect have indicated that there are age changes in encoding abilities with an increase in the number and accuracy of expressions (e.g., Lewis, et al, 1987; Odom & Lemond, 1972; Shields & Padawer, 1983; Zuckerman & Przewuzman, 1979).

Referring to research which indicates that young children demonstrate the ability to discriminate structures and relationships in their environment before they are able to produce them, Odom and Lemond (1972) wanted to determine if there was a similar developmental lag between the perception and production of facial expressions. The authors reported that a lag was apparent between their subjects'

performances in the perception and production of 6 emotions (surprise, anger, disgust, shame, distress, and fear) for the age ranges tested (5 and 10 year olds). An unexpected finding was that there was no reduction in the lag with increasing age, even though older subjects did make more correct productions than the younger children for each emotion. Odom and Lemond suggest that the production improvement that occurs with age may reflect a more refined store of representations of emotional expressions but production accuracy may be inhibited somewhat by socialization or other factors.

A similar finding reported by Zuckerman and Przewuzman (1979) was that in their study of children ages 2 1/2 to 5 years, older girls obtained higher encoding scores in posing facial emotional expressions than did younger girls, but older boys had slightly lower encoding scores than their younger counterparts. Those results may reflect socialization practices for males which inhibit the development of facial expressivity.

Shields and Padawer (1983) point out that research regarding the development of facial expressions of emotion is based on the assumption that a child's inability to pose a specific emotion is due to the absence of a stable expressive scheme for that emotion. Expressive accuracy has been measured in terms of adult standards (e.g., Odom & Lemond, 1972; Zuckerman & Przewuzman, 1979). Acquisition of a stable expressive scheme by the child has been inferred when the facial expression can be reliably interpreted by others. The authors question the equation of comprehension with communication. They indicate that in order to evaluate expressive understanding, the effectiveness of communication cannot serve as the only measure, and that the meanings

children's own productions have for themselves need to be investigated. A child's scheme for a particular emotion may be reliably posed, identified, and labeled by the child, yet not be interpreted by others. Inaccurate poses may reflect an idiosyncratic scheme for an emotion if the child recognizes and produces the pose consistently.

The purpose of the Shields and Padawer study was to examine the ability of children to recognize their own facial affect and to determine the criteria they use in assessing their expressions. Specifically, the authors were interested in whether children apply the same evaluative standards as adults in judging the content of their own posed expressions. Other aims of the study included an investigation of age-related trends in the development of emotional expressions, i.e., the order of acquisition of facial expressions, and an examination of the comparative difficulty of posing, recognizing, and labeling facial expressions.

The sample consisted of 81 children, 3 to 7 years old, attending preschool and daycare programs in Davis and San Francisco, California. In the younger group, there were 14 boys and 27 girls (Mean CA: 50.5 months) and the older group was comprised of 16 boys and 24 girls (Mean CA: 73.9 months). Subjects were instructed to pose four facial expressions (happy, sad, angry, and scared) which were photographed. After the pictures were taken, they were placed in front of the subject who was asked to select the photo depicting the emotion named by the experimenter. Upon a second presentation of the photographs, the child was asked to label the emotion shown. Following the child interviews, seven undergraduate psychology students rated each picture.

To assess the comparative difficulty of different facial expressions as well as discrepancies between comprehension and production, three dependent measures were used: 1. pose accuracy based on adult raters' judgments; 2. recognition accuracy determined by the child's selection of a photo corresponding to the pose for that emotional label; and 3. label accuracy evidenced by the child naming the emotion expressed in his/her own photo. Children's standards of expression judgment were examined for idiosyncratic schemes (the correspondence between pose instruction and the child's recognition and labeling of the expression).

The older group was more successful than the younger group in posing, recognizing, and labeling across all emotions. No gender or age by gender interactions were significant. Most children (96% of the total sample) could accurately pose at least one expression, fewer children (69%) could identify their own accurate poses, and still fewer (55%) could label those they had recognized. The relative difficulty of posing was assessed in terms of the combinations of the children's accurate expressions. Among children who were only able to produce one expression accurately, happy was significantly more likely than sad, angry, or scared. For children who produced two accurate poses, the happy-sad or happy-angry combinations were significantly more likely than any other possible pairs. The happy-sad-angry combination was slightly more likely than the happy-sad-scared or happy-angry-scared combinations together.

According to Shields and Padawer, an idiosyncratic scheme is indicated by the child's consistent treatment of a pose (production, recognition, labeling) which is unclear to others. The authors suggest

two additional criteria: an idiosyncratic facial expression should occur in the proper position in the sequence of acquisition of the four expressions, and for a particular idiosyncratic expression, the same facial expression should occur on different occasions. Thirty-one children in the sample treated one or more of their unclear poses in a consistent manner. Of that number, the unclear expression was in the correct sequence for 21 children. The photos of those 21 subjects, in which the child posed expressions labeled by the experimenter, were sorted into groups according to the similarity of the facial affect expressed at different times. From the whole sample, 19.8% of the subjects evidenced an idiosyncratic scheme for at least one of the facial expressions.

With reference to the order of development of intentionally produced facial affect, happy was the easiest expression while scared was the most difficult. Anger and sadness were of intermediate difficulty and did not follow a predictable sequence of development in this study. The authors speculate that these two non-positive feeling states may be globally experienced by a young child as "not happy" emotions, and whether anger or sadness develops first may be a function of the affective climate of the child's environment.

Shields and Padawer conclude that three to seven year old children, for the most part, use standards similar to adults when evaluating their own posed facial expressions. According to the authors' criteria, nearly 20% of the children or almost half of the subjects who posed one unclear expression, also exhibited one idiosyncratic scheme for at least one facial expression. Idiosyncratic

schemes may represent a transitional stage of development between lack of comprehension and adult-like expression.

The ability to recognize and label one's own facial expression was not commensurate with the ability to pose it. Shields and Padawer described a sequence of development proceeding from recognition in in others to production to recognition in one's self. This implies that a child may apply different standards of evaluation to his or her own expression than to the expressions of others. In the present study, the findings concerning the order of acquisition for: 1. posing, 2. recognizing, and 3. labeling, are limited because the child's posing accuracy affected the number of poses that the child was then able to recognize and label, possibly depressing the latter scores. In addition, all of the experimental tasks were carried out in a single session which may have enabled the children to remember rather than recognize their poses. The authors note, however, that if memory were a significant factor, the children should have been able to identify and name most of their unclear expressions. Over 80% of the subjects produced unclear or incorrect poses yet less than half recognized or labeled them according to the pose instructions.

Nonverbal Encoding Skills and Cognitive Ability

Intelligence may be read into the face. There is evidence for a positive relationship between nonverbal sending behavior and subjective evaluations of intellectual ability. Confederate children trained to exhibit high frequencies of smiling and 75% gaze (facial observation) in contrast to those instructed to display no smiling and 25% gaze

during a learning situation received higher intelligence ratings from adults in an experimental teaching situation (Bates, 1976).

Haviland (1976) discussed the association of affect and intelligence in infancy by pointing out how those who test infant intelligence use facial affect continuously to infer knowledge. After examining many infant intelligence test items, Birns and Golden (1972) concluded that one of the best predictors of later intelligence test scores is positive affect during testing. Affect is necessary to interpret behavior (e.g., smiling as a measure of enjoyment; crying as a signal of distress; startle as fear; attentiveness as interest or understanding). People respond to an infant "looking smart." Thus, it seems that nonverbal communication by facial emotion expression, sending as well as receiving, is part of an unacknowledged and, therefore unstudied system for assessing intelligence both informally and during standardized testing of infants and probably others as well.

The ability of mentally retarded children to express facial emotion has been addressed in a few studies (see Table 2, Appendix A).

In a longitudinal study, Cicchetti and Sroufe (1976) demonstrated an association between affective expression and cognitive development among 14 infants with Down Syndrome. Eight females and 6 males participated from age 4 months until 24 months; the present study was reported when all the infants were 18 months of age. Each baby was administered a series of 30 "laughter" items at monthly intervals with their mothers as stimulus agents. Test items were grouped into four categories: auditory, tactile, visual, and social. Auditory and tactile items were physically intrusive stimuli (e.g., popping sounds, stroking cheek) in that they required less contribution from the infant

than visual (e.g., "peek-a-boo") which required greater cognitive sophistication to interpret.

Results for the retarded infants were compared with data regarding the onset of laughter available for normal babies. The median age of onset of laughter for the infants with Down Syndrome was 10 months whereas normal infants demonstrated this behavior at 3 or 4 months of age. Even by one year of age, the retarded babies were laughing at only 7% of the test items while on average, normal babies laughed at 25% of the items by seven months of age. Smiling was reportedly more frequent than laughter for the infants with Down Syndrome. Hypotonia commonly associated with the disorder may reduce the intensity of the affective displays. Despite these differences, the performance of the nonretarded and retarded infants were similarly ordered for the various categories; both groups responded first to the intrusive auditory and tactile test items, and then to the more cognitively complex visual and social items. Significant correlations were obtained for the tests of affective expression and cognitive development assessed with the Uzgiris/Hunt Scales and the Bayley Mental and Motor Scales. Cicchetti and Sroufe conclude that affect and cognition are interdependent and that later cognitive performance may be predictable based on the age of onset of laughter and smiling. They suggest that:

> Affective assessment may prove to be a valuable tool for diagnosis and perhaps prognosis of later cognitive development, particularly with Down Syndrome infants who lag greatly in expressive language production and in neuromuscular coordination, thereby making it extremely difficult to obtain an accurate assessment of their intellectual functioning through conventional means (p.928).

Emde, Katz, and Thorpe (1978) investigated emotional signaling in longitudinal studies of both normal and retarded infants. They report findings concerning the early social-emotional development of babies with Down Syndrome. For a group of six retarded infants, crying was judged to be less intense and social smiling was assessed as being less engaging than for their normal age-matched counterparts. In contrast to parents of normal infants, parents of babies with Down Syndrome often report that their infants have "lonely," "mad," or "scared" expressions.

The authors questioned whether the distortions in emotional expressions were from the retarded infants or in the interpretations of those expressions given by their mothers. Twenty-five independent female adults sorted pictures of the emotional expressions of 6 retarded infants at least 3 1/2 months of age. Comparing data on emotional expression available for nonretarded infants with that obtained for the infants with Down Syndrome as well as the similarities in the sortings of the independent judges and the mothers of those retarded babies, Emde et al concluded that, in fact, the emotional signals from the infants with Down Syndrome were abnormal.

Maurer and Newbrough (1987a) reported that the facial expressions of nonretarded children, four to five years of age, were identified more accurately than were those of retarded children (Mean CA: 7 years; Mean MA: 4.5 years). Happiness was correctly judged more often than anger, sadness, and a neutral expression. The "neutral" photographs might have been confusing as it may be questioned whether an absence of facial affect is indeed possible.

In the second part of their study, Maurer and Newbrough (1987b) examined the influence of experience in mental retardation on the ability of nonretarded adults to recognize facial expressions produced by preschool-age retarded children. Thirty-two slides of 4 emotional expressions: happiness, anger, sadness, and neutrality (absence of affect) produced by retarded and nonretarded children were presented to 3 groups of nonretarded adults: 23 adults without experience in mental retardation; 21 parents of retarded children; and 6 teachers of the retarded children pictured in the slides.

Adults inexperienced in interacting with retarded persons recognized fewer facial expressions of retarded children than did parents who, in turn, identified fewer expressions than did the teachers. Teachers were most accurate in recognizing the expressions of the retarded children. Adults without experience in mental retardation recognized the expressions of nonretarded children best, and the parents of retarded children performed equally well in judging the facial expressions of both retarded and nonretarded children. Happiness was the most easily recognized emotion among all the children.

Summary

Research reviewed here indicates that nonverbal encoding abilities improve throughout childhood. However, there is some evidence (Zuckerman & Przewuzman, 1979), suggesting that facial expressiveness may be inhibited among boys as they mature.

Studies of nonverbal expressive development have demonstrated a lag between comprehension and production of facial affect which is analogous to the lag apparent in the development of other cognitive and

language skills. Children comprehend others' facial affect before they can accurately produce the expression (Odom & Lemond, 1972). Shields and Padawer (1983) noted that emotional expressions vary in difficulty. They also investigated the meaning that children's facial emotional expressions have for themselves and suggested that inaccurate poses may reflect lack of comprehension in young children but either a lack of understanding or a lack of effective communication in later development.

The relationship between facial affect encoding skills and cognitive ability is a complex one. Affective responsiveness contributes to assessments of cognitive ability and it raises questions about what is measured by intelligence tests. Haviland (1976) indicates that there is a need for systematic study of the use made of affect in cognitive assessment.

Cicchetti and Sroufe (1976) as well as Emde et al (1978) found a close association between affective expression and cognitive development. Among infants with Down Syndrome, "dampened" affective displays of positive and negative expressions have been observed. In those studies, the age of onset of a social smile was reported to be delayed for the retarded infants relative to normal babies, but it was also deviant because the expression was less intense: when normal infants laughed, babies with Down Syndrome merely smiled.

Infant facial expressiveness, especially smiling, is very important to caregivers. Interacting with a baby with Down Syndrome may be unrewarding due to the diminished emotional expressivity. Maurer and Newbrough (1987a; 1987b) showed that the affective displays of seven year old retarded children are also difficult to read. Such

troubled interactions may have an adverse impact on social/emotional development because the social reinforcement history of the retarded child may be atypical or deficient. Nonverbal communication inaccuracy may have significant implications for an individual in terms of negatively influencing the expectations of others regarding social, educational, or occupational potential, and concomitantly, the opportunities for development that are provided.

Measurement Issues

Measurement is always an issue in the study of facial expressiveness as nonverbal behavior usually occurs as part of a complex social interaction. Assessment techniques are varied and the findings are a function of the particular measurement procedures employed.

Many studies concerned with the facial expressiveness have used posed nonverbal cues. Because posing an emotion is an act intended to communicate affective information, it reflects a person's knowledge of the appropriate facial cues and how to produce them. One need not experience the emotion to pose it. On the other hand, spontaneous expression of affect does not necessarily have a communicative function and may be controlled by social rules to de-intensify public emotional displays. Zuckerman et al (1976) addressed the issue of whether posed facial expression is a socially learned code that is unrelated to spontaneously produced cues or whether posed and spontaneous cues are similar even though they are elicited under different circumstances.

Zuckerman and colleagues investigated the relationship between posed and spontaneous cues as they occurred within the same individual.

Encoding and decoding of posed cues were compared with encoding and decoding of spontaneous cues. The subjects were 30 male and 30 female undergraduates. Each subject was shown 30 second videotapes of scenes selected to arouse various degrees of pleasantness or unpleasantness. Following a neutral videotape, scenes depicting comedy, an adult/child interaction, a murder, and a traffic accident were presented to the subject in random order. Facial reactions were videotaped without the subjects' knowledge. A verbal report of reactions was obtained as well as a posed emotional response to each scene. Decoding tasks were arranged by alternating two groups of subjects and having them judge the responses generated in the study according to exact and pleasant/unpleasant categories. A scene accurately encoded meant that it was accurately decoded.

The results showed that posing produced a higher level of accuracy than the verbal reactions. Verbal descriptions were not a good indicator of either facial affect encoding or decoding ability. An extremity effect was present wherein scenes chosen to be at the pleasant/unpleasant extremes (comedy and traffic accident) produced a higher level of accuracy than those judged more moderate (adult/child interaction and murder). Females were more accurate decoders than males but encoding scores were not significantly different for males and females. Significant correlations were obtained between the encoding of posed and spontaneous cues and between the decoding of posed and spontaneous cues. The authors conclude that posed and spontaneous behaviors are related, involving similar skills, and, therefore, posed or spontaneous cues may be used interchangeably in encoding and decoding tasks.

The decision to measure posed rather than spontaneous encoding ability raises another question about the appropriateness of the methodology. It might be argued that genuine or spontaneous emotional expression has greater value in social interactions than does the expression of posed emotion. Nonetheless, people are frequently required to control or pose emotions in order to communicate, for example, to convey empathic understanding. By posing an emotional expression, one voluntarily displays affect according to social rules so that the ability to use facial behavior to communicate is demonstrated.

Another consideration in measurement is that many factors may negatively influence nonverbal communication test results besides nonverbal communication deficits. Lack of prerequisite test taking skills, such as receptive and expressive language problems, may penalize retarded subjects. Reeves (1985) reported that a facial affect labeling test proved to be more difficult than a recognition task for retarded subjects. Identification procedures, therefore, would seem to be a better choice for testing retarded individuals by reducing the demands for verbal expression which may confound the findings on tasks meant to address nonverbal behavioral abilities. Posed facial emotional expressions should be easier to identify because they tend to be more intense than spontaneous expressions which may be controlled by social rules to mask emotional displays in public.

If encoding and decoding tasks are carried out within a single session, questions might be raised as the whether memory was an enabling factor in the subjects' performances. That is, when the subjects are asked to decode facial expressions that were just

produced, they may remember rather than recognize the pose. To determine differences in recognition accuracy over time, the identification tasks should be given immediately following the picture taking session and then repeated after a delay.

Typically, the decoding abilities of retarded persons have been measured by using photographs of idealized facial expressions of non-retarded persons. As a mode of communication requiring reciprocity, it would seem more informative to assess nonverbal behavioral abilities among a group of peers. In a social situation which is relevant to the subjects, it is possible to determine how attuned retarded persons are to nonverbal communication when peers complete decoding tasks with regard to each other's behavior.

Evidently, little is known about the ability of retarded persons, particularly adults, to encode facial affect. Testing knowledge of socially learned codes for conveying emotional states through posed facial expression would provide a perspective on general communicative competence and interpersonal functioning among retarded individuals.

Statement of the Problem

In social interactions, there are always exchanges of para-linguistic information. Facial behavior is a specific nonverbal skill that can be employed during social interactions to achieve interpersonal goals. Difficulties in understanding or in using nonverbal behavior hinders communication and may lead to social isolation or rejection. Inadequacies in nonverbal communication skills may result in social failures which contribute to the personal and vocational adjustment problems often described among retarded individuals.

The present study was designed to investigate the link between the nonverbal communication skills of interpreting as well as expressing facial affect and cognitive ability, social skills, and level of adaptive functioning for a group of retarded adults. It was hypothesized that there would be individual differences in nonverbal skills which exist independently of cognitive ability. Another assumption was that nonverbal behavioral abilities are related to other social skills so that retarded individuals who display a particular level of competence in their ability to communicate nonverbally should also show a similar level of competence in other aspects of social functioning. That is, retarded persons with better general interpersonal skills should be more proficient in encoding and decoding facial affect than retarded individuals with less adept social skills. It was also predicted that the more sensitive and expressive subjects would have a higher level of adaptive functioning indexed by background information concerning personal and occupational adjustment.

Unanswered or Unasked Questions

How effectively can retarded persons understand and use facial behavior to communicate emotions?

To evaluate nonverbal understanding, accurate expression cannot be the only criterion. The meanings that subjects attach to their own facial expressions need to be explored as well. Do retarded adults apply the same standards as nonretarded adults in judging the affective content of their facial expressions? Error patterns in encoding and decoding emotional expressions might be revealing as to the affective quality of their environment.

General cognitive abilities, including such processes as attention, memory, and abstract reasoning, undoubtedly have a profound impact on the social functioning of retarded persons. The important questions are: how great is this influence and does proficiency in nonverbal communication contribute to interpersonal effectiveness?

In examining the ability of retarded adults to use nonverbal modes of communication as a function of social competence, the following hypotheses were tested:

1. There are no statistically significant differences in the proficiency of retarded adult males and retarded adult females to express or to interpret facial affect.

2. There is no significant relationship between age and nonverbal abilities, i.e., scores on tests of decoding and encoding facial affect.

3. There are no differences in the accuracy with which the specific emotional expressions of happiness, sadness, anger, and fear are identified among a group of retarded peers.

4. There are no differences in terms of the accuracy with which various facial emotional expressions are encoded by a group of retarded adults.

5. There is no relationship between the nonverbal communication abilities of encoding and decoding facial affect.

6. There are no differences in the judgments of facial emotional expressions given by nonretarded adults who are familiar with the subjects and the ratings given by nonretarded adults who do not know the subjects.

7. There are no significant differences in the ratings of facial affect assigned among a group of retarded peers and the ratings of those same facial emotional expressions given by nonretarded adult judges.

8. There is no significant difference between the subjects' judgments of their own facial emotional expressions upon immediate and delayed presentations of the self-assessment task.

9. There is no relationship between the ability to judge the emotional content of one's own facial expression and the ability to judge the facial affect of peers.

10. There are no significant differences between the subjects' assessments of their own facial emotional expressions and the judgments of those same expressions given by co-workers.

11. There is no significant relationship between self-assessments of facial affect and the assessments of those expressions by both familiar and independent nonretarded judges.

12. There are no significant relationships between cognitive ability (IQ test scores) or social skills (work supervisors' ratings) and the ability to interpret one's own facial emotional expressions.

13. There are no significant differences in nonverbal communication abilities among the subjects according to their general adaptive functioning.

14. There are no significant differences between subjects with a history of psychiatric disorders and those without such a history on several variables including: nonverbal communication abilities, cognitive ability, social skills, and age.

15. There are no significant relationships between cognitive ability as defined by IQ scores and nonverbal communication abilities defined by: 1) decoding scores which represent the number of accurate identifications of the facial emotional expressions of retarded peers, and 2) encoding scores which are assigned by peer ratings of the facial affect posed by each subject.

16. There are no significant relationships between socialization as assessed by workshop supervisors and facial affect decoding and encoding skills.

17. There are no systematic variations in nonverbal communication skills as a function of a set of variables including: cognitive ability, social skills, general adaptive functioning, personal history, and tests of interpreting or expressing facial affect.

18. Nonverbal communication abilities of encoding and decoding facial affect do not add to the prediction of social skills beyond that afforded by general cognitive ability.

CHAPTER III

METHOD

Subjects

Subjects for this study were recruited from a population of approximately 100 employees at Morgan Memorial Goodwill Industries, a sheltered workshop in Beverly, Massachusetts. To protect the rights of the retarded adult clients, procedures for obtaining informed consent and for ensuring confidentiality were carried out according to the recommendations of the Research Review Committees at the University of Massachusetts, Amherst, Morgan Memorial Goodwill Industries, and the Massachusetts Department of Mental Health and Mental Retardation (see Appendix B). Employees were given an oral explanation as well as a letter describing the goals and nature of the project. The employees were also encouraged to discuss the study with trusted persons, such as family members or counselors, before agreeing to participate. If necessary, legal guardians were contacted to co-sign consent forms.

Employees were offered reimbursement for time away from their regular jobs to participate in the study. As an incentive, $1 was offered as additional payment for each of 2 sessions of approximately 30 minutes which were required to complete the project. That amount exceeded the base rate of pay for most of the employees. Sixty-eight persons were approached about taking part in the study. Of that number, 7 employees refused to participate, the guardians of 6 employees declined to grant permission, 3 persons did not return consent forms, and 52 employees agreed to take part in the study.

The sample was composed of 19 male and 33 female White adults classified as mentally retarded. The age range was from 22 years to 56 years (Mean CA: 34.9 years). Intelligence test scores reported in employee records and estimated from the Wechsler Adult Intelligence Scale, the Wechsler Adult Intelligence Scale - Revised, or the Stanford-Binet Intelligence Scale, ranged from 20 to 87 (Mean IQ: 56.1; SD: 13.6); separate Verbal and Performance IQ scores were available for 40 subjects who had been tested with the Wechsler Scales. IQ scores for most of the subjects (34) were between 50 and 70 which is in the mild range of retardation; 8 subjects with IQ scores from 71 to 87 were in the borderline to low average range of intelligence; 5 subjects had IQ scores between 35 and 49 in the moderate range of retardation; and 5 subjects with IQ scores falling between 20 and 34 were in the severe range of retardation. Those levels of retardation, based on IQ scores, are the American Association on Mental Deficiency classifications (Grossman, 1983). None of the subjects had significant sensory (i.e., vision, hearing) or motor impairments which would have precluded their participation in the study.

Information contained in employee records which reflected the subjects' general adaptive functioning was also collected, including: educational background; history of institutionalization; history of psychiatric problems; current residence; years of continuous employment at Morgan Memorial Goodwill Industries; and present job status. All subjects had been involved in special education programs during childhood, but detailed school histories were not available. Ten subjects had been institutionalized for at least 10 years before the age of 18 years. The records of 12 subjects described a history of psychiatric

problems, primarily antisocial personality disorders (8 subjects) and affective disturbances (depression) for 4 subjects. At the time of study, 28 subjects resided with their families and 24 subjects lived in community residences, such as group homes or staffed apartments. Years of employment at Morgan Memorial Goodwill Industries ranged from under 1 year to 9 years, with a Mean of 3.7 years. The employment status of 37 subjects was within a sheltered workshop, and 15 subjects were involved in supported work (semi-competitive) programs.

Because of the possibility that subjects at similar levels of cognitive and adaptive functioning would exhibit different levels of interpersonal competence, each subject was rated on a social skills scale by his or her supervisor in the workshop. Three supervisors (2 females, 1 male) rated only those subjects with whom they worked. Instructions were to complete the Socialization section (Domain 9) of the AAMD Adaptive Behavior Scales (1981) based on observations of the subject's behavior in the workshop over the past 3 months. The Socialization section was selected because it purports to measure ". . . the level of social interaction and consideration for others, and is particularly useful in understanding a person's relationships to his or her peers" (p.16). Norms are available for the AAMD Adaptive Behavior Scales up to age 17 years; reference groups are students assigned to regular, educable, and trainable school programs. Items on the Socialization scale address the following general areas: cooperation, consideration for others, awareness of others, interaction with others, participation in group activities, selfishness, and social maturity (see Appendix C). A high score out of a possible 26 points on

the Socialization scale suggests that the individual is able to interact in a positive way with others whereas a low score offers evidence of social difficulties. Scores for this sample ranged from 3 to 26 (Mean: 19.1; SD: 3.96).

Procedures

Encoding. For the initial phase of the project, subjects were seen individually and asked to pose facial expressions of five emotions: disgust, happiness, sadness, anger, and fear, which were photographed. The first emotion to be expressed (disgust) was a practice item given to explain the task of posing, to allay anxiety about the procedures, and to provide a distractor stimulus for subsequent decoding tests. Subjects were shown black and white photographs of facial expressions of "disgust" posed by a male and female adult. Those pictures were chosen from the Ekman and Friesen series (1975) as best examples of the emotional expression, i.e., the highest reported inter-rater reliability in correctly judging "disgust" as the facial affect depicted (see Appendix D). Because it is an unpleasant emotion, disgust was selected as an imitation task for the practice item to provide a contrast with the next posing task which involved a positive feeling. Accompanying the presentation of the two idealized pictures, an audio tape with a definition and a story to convey the feeling of disgust was played for each subject ("Disgust means sickening, yuckey: The person sitting next to you throws up. You are disgusted"). The subject was then photographed while posing a disgusted facial expression.

Of particular interest in this study were the emotions of happy, sad, angry, and afraid. Ekman and Friesen (1975) report these to be among the cross-culturally recognizable facial expressions of emotion. Posed facial expressions were photographed with a Polaroid 660 camera set on a tripod about 2 feet away from the subject's chair. The experimenter's face was hidden behind a black cloth to prevent inadvertent cues. Multiple labels, an appropriate tone of voice, and a brief illustrative story were presented via audio tape to describe each emotion for the posing task. Directions were to "make a face" which corresponded to the emotion named in the story. After listening to the instructions for each emotion, the subjects were informed that the tape would be replayed if they wished to hear it again. Stories were composed so that the language structures were simple and the content reflected common life experiences or situations that could easily be imagined.[1] A transcript of the audio tape follows:

1. Happiness (happy, joy): "It's your birthday and you are happy."

2. Sadness (sad, unhappy): "Your dog is sick and is going to die. You are sad."

3. Anger (angry, mad): "Someone stole your lunch. You are mad."

4. Fear (scared, afraid): "You are being chased by a lion and you're afraid that you won't get away."

Encoding scores were obtained from decoding tasks given in the second part of the study. Based on the subject's posing intent, the number of correct identifications by peers and independent judges as

well as self-assessments yield encoding scores. An emotional expression accurately decoded means that it was accurately encoded.

Decoding. A decoding test which required that the subjects identify the affective content of their own pictures, was given during the first session following the encoding tasks.

When the Polaroid pictures developed, each photograph was coded according to subject and emotional expression. Only the subject's head and shoulders were to appear in the photograph. In some cases, the lower portion of the photo was taped so that the face was the primary stimulus to convey the emotion. Taping raised the lower white border of the print up to 1/2 inch to cover any body cues that might have been unintentionally captured in the picture. Ten out of 260 photographs were so taped.

Five photographs, including the four emotions of interest in the study, as well as the picture taken as a practice item, were then placed in a row in random order in front of the subject. The subject was asked to point to four of the five photos depicting the emotions as named by the experimenter: 1. happy; 2. sad; 3. mad; and 4. afraid; stories describing the emotions were also repeated. Guessing was encouraged if the subject was reluctant to respond.

Accurate decoding indicated a correspondence between the pose instruction given in the encoding phase and the subject's recognition of the emotional expression which had been posed earlier in the session. Confusions among the expressions were recorded. An encoding score was also obtained as the number of correct identifications in terms of the subject's posing intention.

Self-assessment tasks were repeated with each subject after a delay of two weeks. During the second meeting, individual subjects were again asked to identify their own posed expressions as well as photographs of the facial emotional expressions produced by 25 peers in the workplace. Procedures were the same as those described for the initial decoding test conducted in the first session. Upon a random presentation of five photographs, the subject was asked to select the pictured emotions of happy, sad, mad, and afraid as labeled by the experimenter. A series of 26 identification tests were carried out with every subject during the second session to include a self-assessment task and the judgment of the facial expressions of 25 co-workers. Once again, subjects were prompted to guess if they were unsure of a response. Correct and incorrect identifications were noted. A facial emotional expression accurately decoded was considered to have been accurately encoded.

Following the interviews with the subjects, eight nonretarded White adults who were professionally employed in various human service fields, were asked to judge each photograph according to its emotional content. All subjects and judges were White so that no cross-race judgments were made. As supervisors at Morgan Memorial Goodwill Industries, four raters were familiar with all of the subjects. The other four judges did not know any of the subjects, and reported minimal to no experience with retarded persons. Beyond the directions to assess the expressive content of each picture carefully, the raters were not trained so that their evaluation reflected the subject's ability to communicate emotion generally.

Nonretarded judges categorized the pictures of the entire sample in the aforementioned manner of an identification task as performed by the retarded subjects. Raters were not told that the emotion "disgust" was the distractor item and they were encouraged to guess to provide a response. The five pictures taken of each subject were randomly displayed and the judges chose the four emotions of interest (happy, sad, mad, afraid). This decoding task was repeated for all 52 subjects. Agreement between six of eight raters was the criterion for classifying poses as accurately representing specific emotions. Encoding scores were assigned as the proportion of correct identifications based on the intention of the sender.

CHAPTER IV

RESULTS

Gender Differences

T-tests were used to determine whether the mean scores for males and females on various encoding and decoding tasks differed significantly from each other. No differences were shown between the performances of males and females in expressing facial affect; encoding scores derived from both self-assessment tasks were not statistically significant at the .05 level: immediate ($t=-.95$; $p=.345$) and delayed ($t=-1.62$; $p=.112$). In addition, there were no significant gender differences in terms of the encoding scores assigned by peers ($t=-.26$; $p=.794$), by the ratings of familiar judges ($t=-.49$; $p=.626$), and by the assessments of independent judges ($t=.13$; $p=.901$). On peer decoding tests, which involved the ability to interpret the facial emotional expressions of others, the mean decoding scores for males and females were not significantly different ($t=.18$; $p=.857$). Therefore, the first null hypothesis of no difference between the gender groupings in this sample on facial affect encoding and decoding tests cannot be rejected (see Table 3, Appendix E).

Age Differences

Significant negative correlations were obtained for age and total peer decoding scores ($r=-.2284$; $p=.05$) as well as for age and facial affect self-assessment scores ($r=-.2668$; $p=.028$). Younger subjects performed better than their older counterparts on both self and peer decoding tasks. Those results contradict the hypothesis (#2) of no

relationship between age and decoding skill. On the other hand, age and encoding scores derived from peer judgments were not significantly associated ($r=.09$; $p=.26$). In this study, age was not related to the ability to express facial affect, a finding which is compatible with the second part of the hypothesis.

Communication Accuracy

To assess the comparative difficulty of identifying specific facial expressions produced by retarded peers, t-tests for correlated means were employed. Using the Bonferroni procedure to adjust the alpha level for multiple t-tests, the results were significant at the .01 level. Happiness was the easiest emotion to decode when contrasted with sadness ($t=12.6$; $p=.00$); with anger ($t=13.73$; $p=.00$); and with fear ($t=17.83$; $p=.00$). Sadness was easier to decode than anger ($t=4.51$; $p=.00$) and fear ($t=6.36$; $p=.00$). Anger was easier to recognize than fear ($t=2.64$; $p=.01$). For this sample, facial emotional expressions evidently varied in difficulty to interpret. The hypothesis (#3) of no differences in terms of the accuracy of identifications across the four emotional categories of interest in this study, was not supported by these findings (see Table 4, Appendix E).

The relative difficulty of posing the facial emotional expressions of happiness, sadness, anger, and fear (hypothesis #4), was determined by examining the combinations of expressions. Subjects were first grouped by the number of accurate poses, i.e., poses recognized by six out of eight nonretarded judges. Then, the proportion of subjects who produced the correct pose or combination of poses was contrasted with the proportion who produced all other possible

combinations. Chi square tests for the significance of the difference between proportions were used to contrast the proportion of subjects who produced the expected pose or combination of poses with the proportion who produced other possible combinations. Number and percent of subjects with each possible combination of poses correct are listed in Table 5, Appendix E.

Of those subjects who could pose only 1 expression accurately (42% of the total sample), the expression was significantly more likely to be happiness than sadness, anger, and fear. For subjects with 2 accurate poses (23%), the happiness/sadness combination was significantly more likely than the happiness/anger or fear, the sadness/anger or fear, and the anger/fear combinations. Using the 75% agreement criteria for accurate encoding, only two subjects exhibited a three pose repertoire of happiness/sadness/anger and happiness/sadness/fear.

Encoding vs. Decoding Skills

There was a significant correlation between facial affect decoding and encoding scores for this sample ($r=.322$; $p=.01$). Subjects who obtained high scores on tasks of decoding the facial emotional expressions produced by retarded peers also tended to receive high encoding scores from those peers who judged their facial affect. Moreover, scores obtained by the subjects on peer decoding tests were also highly correlated with encoding scores assigned by familiar ($r=.23$; $p=.05$) and independent ($r=.39$; $p=.002$) nonretarded judges. Mean scores on decoding and encoding tests were not significantly different (pairs $t=.01$; $p=.989$). Hypothesis #5, which suggested no relationship between

nonverbal encoding and decoding scores, was not supported. See Table 6, Appendix E.

Ratings of Familiar and Independent Judges

Overall ratings of the subjects' facial expressions by nonretarded familiar judges and nonretarded independent judges were highly correlated (r=.75; p=.00). The difference between the mean scores of the familiar and independent judges was not statistically significant (pairs t=1.77; p=.082). Those results, supporting hypothesis #6, are summarized in Table 7, Appendix E.

Ratings of facial affect given by nonretarded familiar and independent judges were related to the assessments of facial expressions given by peers; Pearson Correlation Coefficients were .644 and .673, p=.00, respectively. However, there were significant differences in the proportion of correct identifications for the nonretarded and retarded raters. Both the familiar and the independent nonretarded judges had a higher percent of accurate ratings than the group of retarded judges. Findings indicated significant differences between the familiar nonretarded judges and retarded judges (pairs t=5.04; p=.00) as well as the groups of independent raters and peer raters (pairs t=3.26; p=.002). Hypothesis #7, concerning no differences in the judgments of retarded and nonretarded raters, was not supported. Table 8 in Appendix E contains these results.

As a group, retarded adults were less adept than nonretarded adults in decoding facial affect in this study. Nevertheless, it should be noted that there was considerable variability in the scores obtained by the retarded group (range: 18 to 60) as compared to the

range of scores from 39 to 54 for the nonretarded judges. Total decoding scores of 24 out of 52 retarded subjects equaled or exceeded the scores of the nonretarded adult judges.

Self-Assessments

Performance on the immediate and delayed self-assessment tasks were highly correlated for the 52 subjects (Pearson r=.364; p=.004). A t-test for correlated means indicated that there was no difference in the mean scores for the immediate and delayed self-assessment tests (t=0; p=1.00), and that evidence supports hypothesis #8 (see Table 9, Appendix E).

Scores on the immediate and delayed self-assessment tasks, reflecting the ability to judge the affective content of one's own facial expression, were significantly correlated with decoding scores, i.e., the ability to read the emotional expressions of co-workers. Pearson Correlation Coefficients were statistically significant at the .05 level (r=.273; p=.025 and r=.244; p=.041) for the immediate and delayed self-assessment test results with peer decoding scores. Those findings do not support the hypothesis (#9) of no relationship between skills of decoding facial affect in one's self and from familiar others.

Pearson Correlation Coefficients showed significant relationships between total scores obtained on immediate and delayed facial affect self-assessment tasks by retarded subjects and the overall ratings of those same expressions by their retarded peers in the workplace (r=.388; p=.002 and r=.36; p=.004). Subjects who were more accurate in

their self-assessments also obtained higher encoding scores from their peers.

Significant differences for accurate vs. inaccurate facial affect identifications for self-judgments and peer ratings were shown for happiness (t=-3.50; p=.001); sadness (t=-2.93; p=.005); and anger (t=-2.11; p=.04); but not for fear (t=-.82; p=.414). Thus, subjects who accurately judged their own facial expressions of happiness, sadness, and anger, also received high encoding scores for those specific emotions from their peers. These findings provide evidence which supports the hypothesis (#10) of no differences between self-assessments and peer judgments of specific facial emotional expressions (see Table 10, Appendix E).

Self-assessments were also highly correlated with ratings of both familiar (r=.507; p=.001) and independent (r=.512; p=.001) judges, that is, subjects who had high encoding scores derived from the self-assessment tasks also obtained high encoding scores from their workshop supervisors and independent nonretarded adult judges. This evidence contradicts hypothesis #11 which suggests no relationship between self-assessments of emotional expressions and the ratings of independent judges.

No significant correlations were found in comparing the self-assessment scores with IQ scores (r=.009; p=.475) or with the total score on the Socialization Scale of the AAMD (r=.121; p=.197). High scores on tasks requiring the self-judgment of facial emotion were not necessarily associated with high IQ scores or high ratings for social

competence from work supervisors. The hypothesis (#12) of no significant relationships between cognitive ability, social skills, and the ability to interpret one's own facial affect cannot be rejected.

There was no compelling evidence for the use of idiosyncratic schemes. Only 5 out of the 52 subjects (9.62%) consistently identified their poses on both the immediate and delayed self-assessment tasks. Of those five subjects, only two individuals made an error and then treated that incorrect pose in the consistent manner. Although the facial expressions of the five subjects who reliably identified their own poses were not always clear to others, they tended to be more accurate senders and their encoding scores from peers and nonretarded judges were up to one standard deviation above the mean encoding score for the entire sample.

Nonverbal Communication and Adaptive Functioning

As an index of general adaptive functioning, information concerning the subjects' personal and occupational adjustment was obtained from employee records. With the notable exception of psychiatric history, hypothesis #13 was generally supported because the subjects did not differ in nonverbal communication abilities assessed by means of facial affect encoding and decoding tests with respect to other background variables including: institutionalization during childhood, current residence, and employment status (sheltered vs. semi-competitive work settings). Table 11 in Appendix E summarizes the results.

T-tests for differences in nonverbal behavioral abilities among subjects who had been institutionalized during childhood and those

without such a history were not significant (Decoding: t=.46; p=.645; Encoding: t=-1.27; p=.210). In terms of current living arrangements, there were no significant differences in nonverbal communication abilities for subjects placed in community residences versus those living with their families (Decoding: t=1.23; p=.225; Encoding: t=-.90; p=.370). A one-way ANOVA (years by employment status) did not reveal any significant differences between the subjects in terms of the number of years of continuous employment and their current employment status (F=.898; p=.348), i.e., those subjects who had been employed the longest at Morgan Memorial Goodwill Industries did not necessarily have a higher, semi-competitive employment status than subjects with fewer years of work experience. Apparently, placement in a less restrictive work environment for this sample had a different basis than seniority. Finally, there were no significant differences in encoding and decoding scores for subjects in either the sheltered or semi-competitive employment groups (Decoding: t=-1.38; p=.18; Encoding: t=-.022; p=.98).

A MANOVA with 1 between subjects factor of psychiatric history was performed to determine if the subjects differed on a number of characteristics (refer to hypothesis #14). The independent variables were the two groups of subjects with and without a history of psychiatric disorders; dependent variables were decoding and encoding scores, socialization scores, IQ scores, and age. There was a significant multivariate effect between subjects with a psychiatric history and subjects without a psychiatric history when the dependent variables were considered together (F=2.74; p=.03). Univariate F tests showed that the decoding scores were accounting for the differences between

the groups (F=5.66; p=.02). Subjects classified as mentally retarded with a history of psychiatric problems obtained significantly higher scores on decoding tests than the other retarded subjects without a psychiatric history. The two groups did not differ significantly on encoding tasks (F=.476; p=.494); on socialization ratings (F=.214; p=.65); on IQ tests (F=2.03; p=.160); or age (F=.997; p=.323). See Table 12, Appendix E.

Correlates of Nonverbal Skills

Significant correlations were found between total peer decoding scores and Full Scale IQ scores (r=.3459; p=.006); Verbal IQ scores (r=.3134; p=.024); and Performance IQ scores (r=.4590; p=.001). Only Performance IQ scores were significantly related to encoding scores (r=.2808; p=.04) as well as decoding scores. Contrary to the stated hypothesis (#15), this evidence suggests that nonverbal communication abilities are related to general cognitive abilities.

In addition, significant correlations were obtained between social skills ratings by supervisors and peer decoding scores (r=.2537; p=.035) and encoding scores assigned by peers (r=.2839; p=.021). Of the 7 subcategories of the AAMD Socialization Scale, significant relationships were obtained between peer decoding scores and the sections addressing: 1. cooperation (r=.2531; p=.035); 2. awareness of others (r=.2891; p=.019); 3. interaction with others (r=.2563; p=.033); and 4. participation in group activities (r=.2423; p=.042). Other subcategories involving consideration for others, selfishness, and social maturity were not significantly associated with decoding scores. Only the scores on the third section, "interaction with

others," showed a significant correlation with encoding scores assigned according to peer ratings ($r=.4117$; $p=.001$). These findings do not support the hypothesis (#16) of no significant relationship between social competence and nonverbal behavioral abilities.

Separate analyses were carried out with encoding scores assigned by peers and peer decoding scores as the dependent variables. Stepwise multiple regression analysis was employed as an exploratory technique to try to identify a subset of variables that would be useful in predicting the dependent variables or in understanding the factors that influence their variability and to eliminate those variables which do not contribute to prediction beyond that basic subset. Specifically, the analysis sought to determine if the addition of information regarding cognitive ability as defined by IQ test scores; social skills estimated by workshop supervisor ratings; general adaptive functioning including history of institutionalization, psychiatric history, current residence, and employment status; personal background information, such as age and sex; as well as scores on various encoding and decoding tasks, improved prediction of nonverbal communication abilities for this sample beyond that afforded by single correlations (hypothesis #17). The dependent variables were regressed on all the exploratory variables under consideration.

Preliminary results indicated that the AAMD Socialization subscale addressing "interaction with others" was the best predictor of encoding ability while the subscale, "awareness of others," best predicted decoding skill. Psychiatric history was the best predictor across the various indices of general adaptive functioning. Only those variables

were then entered into the regression equation from their respective categories.

Because the primary interest was in prediction, this dictated a stepwise entry of the variables whereby the data controlled the order. For this sample, Performance IQ scores, age, psychiatric history, and "awareness of others" ratings were important for predicting the dependent variable (decoding) and contributed the most to the multiple correlation coefficient. Those variables accounted for 46% of the variance in the total decoding scores ($p<.01$), but Verbal IQ scores, encoding scores, self-assessment results, and sex did not add to prediction.

In terms of encoding for this sample, scores on the self-assessment task, scores on the "interaction with others" subscale of the Social assessment, Performance IQ scores, and Verbal IQ scores were found to be the best predictors of encoding scores obtained from the peer ratings whereas scores on the peer decoding tests, psychiatric history, sex, and age did not add to the prediction. The ratio of explained variance to the variance to be explained (R^2) equaled .52, which was significant at the .01 level.

From the multiple correlation coefficients, it can be seen that a great deal of the variance in nonverbal behavioral abilities is unaccounted. Variables not measured in this study are also contributing to the variance in nonverbal communication skills.

A path analysis was used to trace the implications of some of the relationships found in this study. Possible "causes" of social skills were evaluated by examining how well other variables predicted it. The unidirectional model suggests that general cognitive abilities, defined

by IQ scores, are causally prior to other variables in the system. The relationship between cognitive ability and social skills was thought to be mediated by skill in nonverbal communication, and, therefore, no significant direct effects were anticipated between cognitive abilities and social skills. Further, decoding ability was assumed to be a prerequisite for encoding skills. Although the statistical technique of path analysis cannot prove causality, it can provide support for the hypothesized relationships and evidence of whether nonverbal communication abilities, in fact, mediate between cognitive and social skills.

Path coefficients for direct effects represent the change in the standard deviation for the presumed effect for each standard deviation change in the presumed cause. For this sample, changing intellectual ability by a standard deviation would change nonverbal decoding skill by .35 of a standard deviation. Indirect effects were calculated by multiplying paths. See Figure 1, p. 65.

From the path coefficients, it can be seen that the primary expectations were not supported and hypothesis #18 cannot be rejected. As anticipated, the direct effect of cognitive ability on social skills (-.09) was not significant. Although the hypothesized connections between cognitive ability and nonverbal decoding (.35) as well as nonverbal decoding and encoding (.29) were both in the expected direction and statistically significant, the direct effect on encoding ability on social skills (.24; $p<.11$) was not significant (see Table 13, Appendix E). Expectations regarding the effects of cognitive ability on social skills are indicated by the path analysis: cognitive ability had a significant direct effect on decoding ability but not on encoding skills; decoding ability did not directly effect social skills

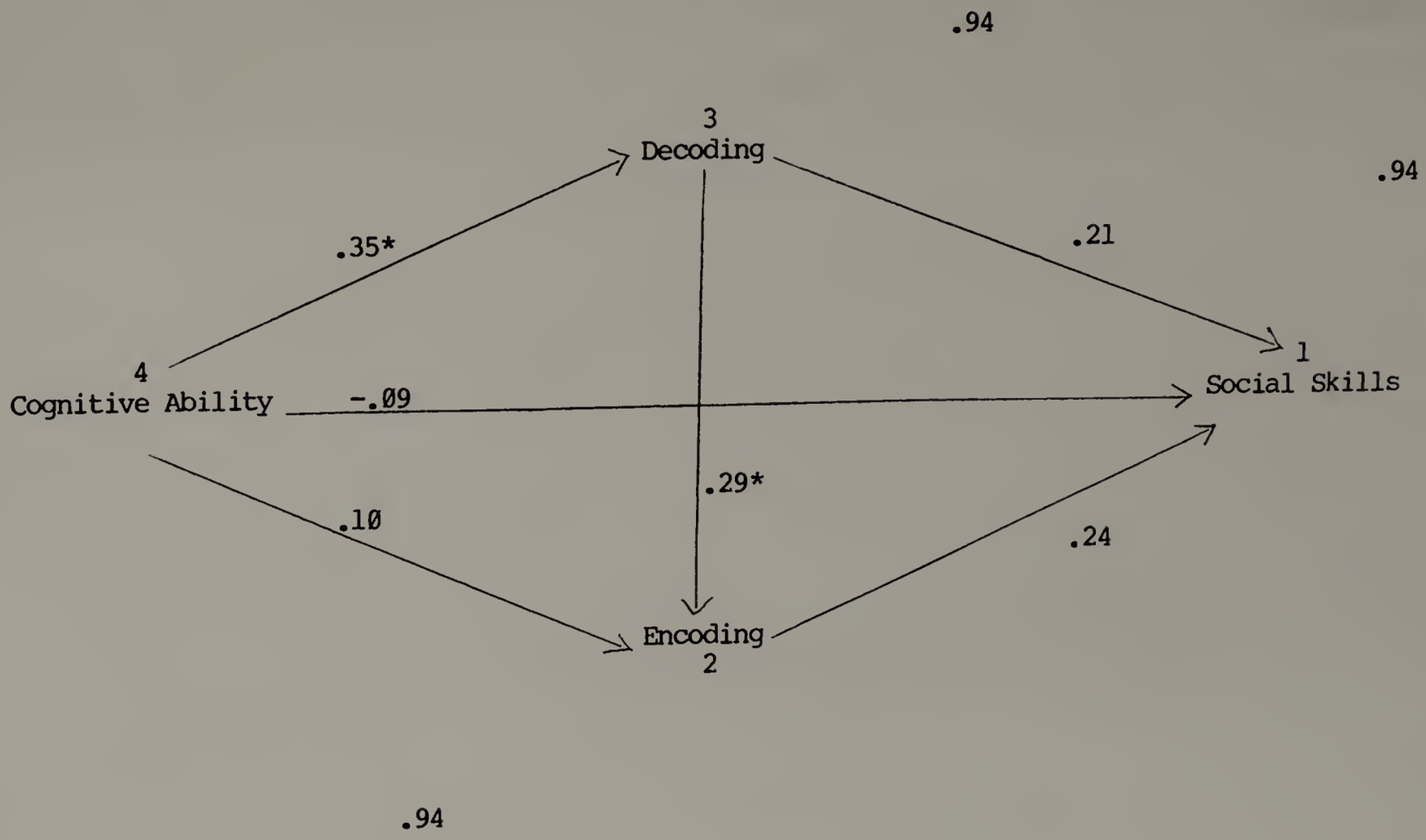


Figure 1: Path Analysis

but was positively related to encoding ability; encoding skills, however, were not significantly associated with social skills. Direct and indirect effects of those bivariate relationships are summarized in Table 14, Appendix E. Nonverbal affective communication abilities did not add to the prediction of social skills. Path coefficients from latent variables also revealed that 88% of the variance in nonverbal communication abilities and social skills remain unexplained by the model outlined here.

CHAPTER V

DISCUSSION

Gender Differences

The issue of gender differences in nonverbal communication, specifically the ability to interpret and produce facial emotional expressions has been addressed in other studies with the preponderant finding that females show greater proficiency than males in decoding and encoding facial affect. In the research reviewed by Hall (1978), females were reported to be more adept than males in decoding nonverbal cues. Zuckerman et al (1976) found that nonretarded adult females were more accurate decoders of facial emotional expressions than were nonretarded adult males, but in that study, encoding abilities were not significantly different between the sexes. Among nonretarded preschool-aged children, Shields and Padawer (1983) did not find differences between males and females in their ability to pose facial expressions. Zuckerman and Przewuzman (1979) reported that older female preschoolers were better able to express facial affect than a younger female group whereas older preschool-aged males performed worse than their younger counterparts leading the authors to speculate that males may be discouraged from expressing facial emotion. Females have generally been shown to be more accurate encoders of facial affect than males in Buck's studies of preschool-aged children (1975; 1977) and under- graduates (Buck et al, 1972; 1974).

Female advantages in nonverbal communication probably have had survival value for humans in terms of mother-child interactions and nonverbal skills are addressed in socialization practices which

encourage females to be more attuned than males to the unspoken needs and feelings of others. Patterns of male and female nonverbal skill development may change as male roles in child rearing expand and gain greater social acceptance because of the economic necessities of today.

Iacobbo (1977) did not report gender differences on facial affect recognition tasks administered to groups of retarded children and adults. In the present study, retarded adult males and retarded adult females did not differ in their ability to produce facial affect according to their own judgments as well as the assessments of retarded peers and of both familiar and independent nonretarded adult judges. In addition, male and female subjects did not demonstrate significant differences in their ability to interpret the facial emotional expressions of their co-workers.

Perhaps gender differences among the retarded subjects in this study would have been more apparent in spontaneous as opposed to posed expressions where males would have been expected to deintensify emotional displays in accordance with social norms. In contrast to the results reported in studies with nonretarded groups, the finding of no difference between retarded males and females in their nonverbal communication abilities might reflect socialization strategies which actually inhibit the development of social skills. Reinforcement histories of retarded females might be deficient or different relative to nonretarded females, stemming from lowered expectations about adult social roles and fears that sociability might lead to exploitation. Other findings of this study concerning differences among the subjects in their ability to read or send messages by facial expression indicate

that there are probably greater differences in nonverbal behavioral abilities within gender groups rather than between the sexes.

Age Differences

Developmental studies have shown that nonverbal communication abilities improve as a child matures (e.g., Gates, 1923; Lewis et al, 1987; Odom & Lemond, 1972). For nonretarded groups, Iacobbo (1977) reported an increase in recognition accuracy for facial expressions of emotion from childhood to adolescence to adulthood, but at old age (Mean CA: 72.5 years), performance dropped to the level typical of a young child. For the sample of retarded subjects in the present study, the age range was from 22 to 56 years (Mean CA: 34.9 years); younger subjects performed better on decoding tasks but there were no significant findings between age and encoding skills.

With advancing years, social perception appears to decline. The reduction in facial affect decoding skills which occurred for a nonretarded group at senescence in the Iacobbo study, was observed at younger ages for the retarded persons in this study, which suggests a premature aging process. Older subjects may have tired more quickly during testing which adversely affected the results. In addition, there is the likelihood that the older subjects in the sample did not have adequate schooling in the past, and were generally less sophisticated in test taking than their younger counterparts.

Communication Accuracy

Findings from this study regarding the relative difficulties experienced by retarded persons in decoding the facial affect of their

co-workers parallel the results of developmental studies (e.g., Gates, 1923) concerning the sequence of acquisition of nonverbal discrimination abilities. Happiness was the easiest emotion to identify, followed by sadness and anger, while fear was the most difficult. Among adults, Gray et al (1983) noted the same sequence of accuracy in recognizing facial emotional expressions, and observed that, for the most part, retarded and nonretarded persons made the same types of confusions. Most studies of decoding ability have used photographs of idealized facial expressions as the stimuli to be interpreted, but in the present study, photographs of a group of retarded peers were used and the same patterns of accuracy in identifying facial affect were obtained.

With regard to the comparative difficulty of posing facial emotional expressions, the sequence obtained in this study (happiness, sadness, anger, fear) was similar to that reported in developmental studies (e.g., Lewis et al, 1987; Shields & Padawer, 1983).

Taken together, previous research findings and the results of this study, indicate that retarded individuals do not differ from nonretarded persons in terms of the difficulties encountered in perceiving or producing specific facial affect. Apparently, facial emotional expressions vary in difficulty to decode and encode. Considering Schlosberg's dimensions (1954), low intensity emotions, such as happiness and sadness, are easier to interpret and express than high intensity emotions (anger, fear).

Appendix F contains photos of subjects who successfully posed the requested emotional expressions.

Encoding and Decoding Skills

Some studies have reported negative or no relationships between facial affect decoding and encoding abilities among adults (Lanzetta & Kleck, 1970; Zuckerman et al, 1975; 1976). The results of this study differed in that subjects who were better decoders tended to be rated as better encoders by their retarded peers as well as nonretarded judges. Significant positive correlations were obtained between scores on tests of receptive and expressive nonverbal communication abilities.

Ratings of Familiar and Independent Judges

Familiarity between sender and receiver has been suggested as an important factor in the accuracy of identifying emotions (Abramovitch, 1977; Maurer & Newbrough, 1987b; Zuckerman & Przewuzman, 1979). To determine whether familiarity with a retarded person provided an advantage in decoding their emotional expressions or whether retarded adults were capable of communicating nonverbal emotional messages generally, the ratings of familiar and independent judges were compared. Work supervisors who had daily contact with the subjects were expected to have been better able to recognize their facial affect than nonretarded independent judges. Yet this was not the case in this study. Nonretarded adults who did not know the subjects and had little or no experience in working with retarded persons did not differ in their judgments of the subjects' facial expressions from nonretarded adults who supervised them in the work setting. This evidence suggests that the subjects did not use idiosyncratic expressive schemes because familiar judges might have been better in recognizing those emotional expressions. The results of this study differed from the findings

reported by Maurer and Newbrough (1987b) that teachers familiar with the subjects were more accurate in interpreting the facial expressions of their retarded students than either parents of the retarded children or adults without experience in working with retarded persons.

According to the findings of Gray et al (1983), retarded individuals were less successful in recognizing facial affect depending on the severity of their mental handicap and in comparison to the performance of nonretarded persons. But retarded and nonretarded groups made the same types of confusion among emotions when they erred, suggesting that the differences were quantitative, not qualitative, for the retarded group. Maurer and Newbrough (1987a) also found that nonretarded adults recognized a higher percent of facial expressions than did retarded adults.

In the present study, retarded adults exhibited greater overall difficulty than nonretarded adults in identifying the facial emotional expressions posed by other retarded adults. However, these results should not be taken to suggest that the retarded subjects in this sample were a homogeneous group with respect to their ability to decode facial affect. Many retarded subjects performed as well, and in a few instances, better than their nonretarded counterparts. Two points are noteworthy: 1. it is unusual to find tasks where retarded individuals may perform as well as nonretarded persons, and 2. nonverbal communication abilities, therefore, may be harder to predict in the presence of mental retardation.

Detterman (1987) suggested that if careful assessments were conducted, mental retardation would not be shown to be a global depression of all abilities. Rather, deficits would vary among retarded

persons with respect to the abilities affected and the severity of the impairment. Individual differences in nonverbal communication abilities would be important in assessing social skills and planning remediation.

Self-Assessments

In their work concerning the self-assessment of emotional expression by young children, Shields and Padawer (1983) questioned whether memory was a significant factor influencing the performance of the subjects in identifying their own facial affect. Because both the encoding and decoding tasks were carried out within a single session in the Shields and Padawer study, the children may have remembered their poses rather than actually recognizing the expressions. This issue is pertinent to the study of idiosyncratic schemes for facial affect wherein an individual may consistently pose and recognize a particular emotion that may not be clear to others.

To further explore the issue of memory versus recognition, an immediate and delayed condition for the self-assessment part of the present study was arranged. If immediate memory for the posed facial expressions was an enabling factor in the self-assessment of facial affect, then a decrement in performance would be anticipated when the test was repeated after a delay. However, the self-assessments of retarded adults under the immediate and delayed conditions were quite similar. Subjects who performed well on the immediate test also performed well on the delayed test. Likewise, those who were less adept in identifying their own posed facial affect on the first test, tended to obtain low scores when the same test was repeated. Moreover,

the mean scores for the subjects under both conditions were the same. It seems reasonable to conclude that solving the immediate and delayed self-assessment tasks required a similar process probably based on recognition of the emotional expression. In fact, another result of the present study indicated that subjects who made accurate self-judgments were also more accurate in decoding the facial affect of peers so, in general, they appeared to be more capable of reading facial emotional expressions.

In this study, it was suggested that retarded persons may have idiosyncratic schemes for emotional expressions. This pertains to the developmental vs. difference controversies regarding the functioning of retarded persons. Based on the work of Shields and Padawer (1983), indicating that children may have stable but idiosyncratic schemes for expressing facial emotion which would be unclear to others, it seemed possible that retarded persons may communicate emotion in an idiosyncratic manner. If so, an individual subject would be expected to reliably judge their own facial expression but others would have had difficulty interpreting the emotion conveyed by that facial expression.

By assessing actual sending abilities (peer ratings) versus self-judgments, the findings of this study regarding the relationship between the ability to identify one's own facial affect and the ability of familiar peers to do the same, did not lend support to the notion that individual subjects possessed idiosyncratic schemes for nonverbal communication. On the other hand, it does not rule out the possibility that as a group, the retarded adults who participated in this project have learned to read the emotional expressions of their co-workers. If retarded adults expressed their emotions in qualitatively different

ways from nonretarded persons, then nonretarded adults might have difficulty interpreting those emotional expressions. Other findings, however, revealed that nonretarded adult judges who were familiar with the subjects and might have learned to recognize their idiosyncratic schemes, did not differ from nonretarded adult judges who did not know the subjects in terms of their ability to read the facial emotional expressions of the retarded adults in this sample. In addition, photographs that were correctly judged as to their affective content by the subjects who posed them were also more accurately identified by nonretarded familiar and independent judges.

Retarded adults in this study used standards similar to nonretarded adults in judging affective responsiveness. The facial expressions posed by the subjects reflected a knowledge of the accepted social codes for communication rather than idiosyncratic schemes. The patterns of difficulties experienced by the subjects in producing or in interpreting facial affect were similar to the sequence of acquisition of nonverbal skills reported in the developmental literature and the confusions that typically occur in reading facial expressions reported among nonretarded adults.

Nonverbal Communication and Adaptive Functioning

There were no significant differences in nonverbal communication abilities among the subjects for three out of four background variables: history of institutionalization during childhood, current residence, and employment status. Those three indices of adaptive functioning are probably multi-determined, and might be greatly influenced by factors

not measured in this study, such as family circumstances, socio-economic level, and geographic location, as well as an individual's interpersonal competence. The findings of no differences in nonverbal communication skills for the subjects according to background variables concerning residence and employment, does not rule out the possibility that nonverbal behavioral abilities influence social functioning and so, indirectly impact on adaptive functioning. A point to be noted about the findings regarding the background variables, however, was the difference obtained for subjects with a history of nonpsychotic, psychiatric disorders and those without a psychiatric history.

Subjects with a history of psychiatric illness received higher scores on facial affect decoding tasks compared to subjects without such a history. These results were surprising because a poor performance on emotion recognition tasks was anticipated for that group based on previous research. Several studies have indicated that persons with emotional or behavioral problems are less adept at identifying facial emotional expressions than individuals without those types of problems (e.g., Austin, 1985; Feldman et al, 1982; Walker, 1981; Zabel, 1979). In the present study, the subjects were all classified as mentally retarded and 12 subjects had a second diagnosis of either depression or antisocial personality disorder.

This sample of retarded subjects was not homogeneous with respect to nonverbal communication abilities; one subgroup differed from the other subjects in decoding ability. Perhaps subjects with a history of psychiatric problems manifest a heightened awareness of nonverbal cues as an aspect of their disorder. For instance, a depressed individual might be extremely sensitive to the nonverbal reactions of others while

a person considered to have an antisocial disorder might use nonverbal information to exploit others. Giannini et al (1987) reported finding an above average ability to read nonverbal messages among some socially deviant groups.

Another observation concerning the results is that the retarded subjects with a history of psychiatric disorders demonstrated unevenly developed nonverbal behavioral abilities. As a group, the subjects with a psychiatric history were better at decoding facial affect, but their encoding scores did not differ significantly from the encoding scores obtained by other subjects. Discrepancies between receptive and expressive nonverbal communication skills may be characteristic of some psychiatric problems although from this study, it is impossible to ascertain whether such a pattern of strengths and weaknesses is the cause or the consequence of the disorder.

Figures 3 and 4 in Appendix F are examples of a male and a female subject from the subgroup with a dual diagnosis of mental retardation and psychiatric disorder who were unable to pose facial emotional expressions. Both subjects received encoding scores which were significantly below the mean (-1 standard deviation), that is, their facial expressions were difficult for their peers to interpret. In contrast, the decoding scores of both subjects, reflecting their ability to interpret the facial affect of others, were above average (+1 standard deviation).

From the photographs, it can be seen that the two subjects did not change their expressions when asked to pose various emotions. Both individuals commented on the difficulties they experienced with the task: the male subject indicated that he could not produce facial

expressions because he did not "feel" the emotions while the female subject reported that she simply could not "do it." Supervisors at Morgan Memorial Goodwill Industries also confirmed that both of these subjects generally display a very limited range of affect in their interactions in the work setting.

Correlates of Nonverbal Skills

It would be unrealistic to assume that a single indicator could capture a complex phenomenon, such as nonverbal communication, reliably or validly. To develop a subset of independent variables that predicted nonverbal behavioral skills for the subjects in this sample, a stepwise multiple regression analysis was carried out. The technique was used to explore the statistical relationships obtained in this study. It was used primarily for prediction and to build rather than test a model concerning nonverbal communication.

Tabachnick and Fidell (1983) point out a difficulty with stepwise regression procedures which is relevant in interpreting the findings reported here. Regarding the stability of the regression equations, a problem lies in the variability of the beta weights over samples from the same population that could produce a misleading subset of predictor variables if decisions were made based on a single sample. Given that caveat, among the variables considered in this study, those which best predicted nonverbal encoding scores included the subjects' self-assessments, their "interactions with others" as estimated by work supervisors, and Verbal and Performance IQ scores; Performance IQ scores, age, psychiatric history, and "awareness of others" ratings were most important in predicting decoding scores. Those variables

accounted for a substantial portion of the variance in nonverbal communication abilities for this sample.

An underlying assumption of this study was that nonverbal communication abilities are required for social competence so that retarded persons who were better able to interpret and express facial affect should be judged more socially skilled in general. Cognitive ability as defined by IQ scores was not significantly correlated with social competence as defined by total scores on the Socialization Scale of the AAMD Adaptive Behavior Scales. The amount of shared variance between the two measures (r=.ØØ1) indicates that the variance in one test predicts very little of the variance in the other. Subjects with higher IQ scores did not necessarily receive higher social skills ratings from their work supervisors; the two tests apparently measured different types of abilities. Scores on tests of encoding and decoding facial affect correlated with both IQ and Socialization scores so that nonverbal communication abilities might be viewed as intervening variables. However, the path analysis indicated that the effects of cognitive abilities on social skills were not mediated by nonverbal communication abilities. It may be that social skills were inadequately measured by the AAMD Socialization Scale.

Limitations

There may have been systematic bias in the self-selection of subjects for this study. Persons who were less socially skilled may have refused to participate in the study, thereby restricting the range of scores on the nonverbal communication tasks and other measures. Of the 68 persons who were asked to take part in the project, 7 refused, 3

did not respond, and 6 guardians did not give permission. Furthermore, it is not clear how representative this sample of retarded adults from a workshop sponsored by Morgan Memorial Goodwill Industries is with respect to the general population of adults with developmental disabilities.

An aspect of the design of the study limits the findings. A subject's posing accuracy affected the number of poses that the subject and peers were then able to identify, possibly lowering the decoding scores. Moreover, accuracy of posing reflected the subject's ability to follow directions as well as to encode the correct facial cues. None of the subjects asked to have the taped instructions replayed even though it was permitted.

The appropriateness or value of measuring posed rather than spontaneous encoding ability might be questioned. Posed facial expressions were measured in this study in order to assess awareness of nonverbal modes of communication and rules for displaying facial affect among adults with developmental disabilities. Furthermore, there is reason to believe that posed and spontaneous emotion reflect the same underlying set of codes; large positive and statistically significant correlations have been found between posed encoding and spontaneous expressiveness (Zuckerman et al, 1976).

Facial Appearance

The importance of appearance in understanding people and in interpersonal relationships has been recognized in literature and drama (e.g., Beauty and the Beast, Cyrano de Bergerac, The Hunchback of Notre Dame, The Elephant Man, Phantom of the Opera). "Lookism" is a term

coined to describe the concern with physical appearances and the prejudice toward the unattractive which is prevalent in our society (e.g., Beauty Bound by Rita Freedman). People tend to link attractive faces with higher intelligence, nicer personalities, and greater professional achievements. Dishonesty, unpleasantness, and stupidity are characteristics often associated with less attractive faces. Laser and Mathie (1982) also found evidence that facial structure influenced the perception of facial expressions.

Our language and emotions are communicated through the face. If there is something different about the face, it can have a major impact on interpersonal relationships. Facial appearance may contribute to variance in nonverbal communication abilities. Because the retarded person's appearance may violate normative expectations, they may be less effective in using nonverbal modes, such as emotional facial expressions, to communicate. Despite its salience, physical appearance has not been considered as a variable in studies concerned with mental retardation, according to Richardson, Koller, and Katz (1985). They point to organic (i.e., dysmorphic features) and experiential (i.e., limited or unusual expressions) factors which may contribute to a greater incidence of atypical facial appearance in individuals classified as retarded than found within the general population. Five subjects who participated in this study had Down Syndrome with the facial features typical of that disorder; other subjects had subtle or no apparent phenotypic anomalies.

An issue in the facial communication of affect may be the relationship of figure to ground: atypical facial appearances among retarded persons may be a distracting background so that the affective

content of their nonverbal behavior is neglected. Longer latencies might be expected when judging the emotional facial expressions produced by a retarded individual which would also disrupt the flow of interpersonal interactions.

Implications

Emotions may be read into the face rather than from it. Expectations about retarded persons may dictate the type of facial behavior that is reinforced. For instance, one common fallacy is that people with Down Syndrome are happy and docile. Beliefs and values concerning mental retardation, such as Of Mice and Men stereotypes (John Steinbeck), may distort interpretations of the facial expressions of retarded persons.

Misunderstanding nonverbal communication may seriously impede the social functioning of mentally retarded persons. The way in which an individual misinterprets the emotional expressions of others may provide clues about his or her experience of the world. Psychosocial circumstances may selectively inhibit the development of the ability to decode facial affect. Parents may want to protect a mentally retarded child from experiencing negative emotions, limit their own expressivity because they assume that the child will not understand, or direct primarily negative affects, such as sadness or anger, toward the child. Furthermore, metaintellectual factors, such as wariness of others or high levels of motivation for social reinforcement (Zigler & Balla, 1982) may decrease or increase the retarded person's sensitivity to all or some part of the social context which consequently, interferes with interpretation. These issues suggest that the rigidity often

encountered with retarded individuals could be a function of their socialization histories rather than inherently rigid cognitive structures (Harter & Zigler, 1974) with the important implication that mentally retarded persons may benefit from remedial programs addressing nonverbal communication.

Given the importance of social skills for the personal and vocational adjustment of retarded individuals (Goldstein, 1972; Greenspan & Shoultz, 1981), it is surprising that social interaction and communication have not been of greater interest to investigators in mental retardation. Simeonsson (1978) pointed out that social competence has usually been defined in terms of practical self-help skills, yet the success of retarded persons in the community depends to a large extent on their interpersonal functioning. The findings of this study suggest that nonverbal affective communication skills are important for social and emotional adjustment.

What might account for this neglect of interpersonal behavior among retarded persons? Perhaps societal fears about the consequences of improving the interpersonal skills of retarded individuals, such as increased job competition or a lessening of prohibitions about sexual expression, has hampered efforts to enhance social functioning. Or perhaps it is difficult to acknowledge that a retarded person has feelings and a need for social interaction.

Enhancing Nonverbal Communication Skills

If a person is unable to discriminate or produce facial expressions, it may be difficult to establish meaningful relationships with

others which may compromise social development. In the present study, nonverbal communication abilities were shown to have effects on social skills, in particular, awareness and interaction with others. Therefore, it seems reasonable to recommend the development and use of preventative or remedial techniques to assist mentally retarded people in improving their nonverbal communication skills to increase the possibility of sharing meanings and to facilitate interpersonal interactions.

Although there has been a proliferation of interventions to improve social skills (Osberg, 1982), only a few programs have specifically addressed the nonverbal communication of affect or have included mentally retarded subjects.

Stickle and Pellegreno (1982) reported success in training high school students to identify facial expressions of emotion. The authors suggest that reducing the variation among individuals in labeling emotions, caused by faulty learning, would lead to greater agreement about affective responses and consequently, improve communication.

In a series of studies, Edmonson and colleagues described improvements in the nonverbal social perception of mentally retarded adolescents after participating in a program designed to teach social cue recognition (Edmonson, DeJung, & Leland, 1965; Edmonson, Leland, DeJung, & Leach, 1967; Edmonson, Leland, & Leach, 1970).

Multiple baseline analyses were used to demonstrate the effectiveness of procedures involving instructions, feedback, social reinforcement, and modeling, to train two retarded boys to use more appropriate facial mannerisms, eye contact, physical gestures, voice intonation,

verbal content, and quantity of speech in a study reported by Matson, Kazdin, and Esveldt-Dawson (1980).

Noting that affective development is frequently overlooked in mental retardation, Corcoran (1982) designed Affect Abilities Training, a competency-based method for counseling retarded persons, which emphasizes the understanding and acceptable expression of emotion. No data was presented by the author as to the effectiveness of the program, however.

Understanding and using nonverbal behavior may assist retarded individuals in asserting themselves to meet their needs for social support. Developing nonverbal behavioral abilities would enhance the general communication skills of retarded persons who may have difficulties with spoken language. Combining spoken language and nonverbal communication systems allows for greater flexibility of expression.

Toward the Future

Findings and implications of this study suggest areas for further investigation.

First, an observation pertaining to the methodology employed in facial affect identification studies. Order of presentation of pictures may influence the results because judgments about affect may be relative. The perception of an emotion may be interpreted in the context of others presented sequentially or simultaneously. For instance, an angry expression presented next to a happy one may be perceived differently, perhaps as sadness, than if it had been placed next to a sad or fearful expression.

Examining nonverbal communication among family members would provide insights into the development of affective sensitivity or expressivity. Comparisons between families with and without a retarded member may be informative about socialization practices which influence the social/emotional development of retarded persons.

Studies of the spontaneous facial expressions among retarded persons would provide further information about their understanding of the affective content of social situations by the appropriateness of their reactions.

Since there is an apparent association of nonverbal communication abilities and some interpersonal skills, it would be interesting to look at the relationship between social motivation, i.e., the need for affiliation, and the ability to understand or express facial affect. Mentally retarded often evidence a high motivation for social approval (Zigler & Balla, 1982), and such personality characteristics might have effects on their nonverbal communication and, thus, influence the quality of their interactions with others.

There is a need for more systematic study of the influence of affective responsiveness in the testing of intelligence. If affect enters into the assessment of cognitive abilities, then it may be possible that a lack of facial expressiveness contributes to a low opinion of intellectual functioning and perhaps, misjudgments about mental retardation.

Psychologists and counselors should be attuned to nonverbal modes of communication in their work. By their own facial responsivity, mental health professionals may send nonverbal messages which contradict their verbal statements or they may inadvertently reinforce or

punish their client's behavior depending on the timing and type of facial affect that is communicated. Greater awareness on the part of the psychologist of the nonverbal communication of feeling states by their clients would provide additional information on which to base treatment decisions. Systematic study of facial emotional expressions may lead to the development of expressive measures to supplement projective techniques in personality assessment. Consideration of nonverbal behavioral abilities would seem to be essential in planning a social skills training program.

APPENDICES

Appendix A

Summary of Studies

Table 1

Studies Investigating the Relationship Between Facial Affect Decoding Skill and Cognitive Ability in Mental Retardation

Investigators	Sample	Cognitive Assessment	Decoding Task	Relationship
Levy, Orr, & Rosenzweig (1960)	96 college students; 50 male mental hospital patients; 66 institutionalized retarded adult males	IQ scores (Mean IQ for retarded group: 62)	48 pictures classified on a happy - unhappy continuum	None
Iacobbo (1977)	218 males & females, ages 7 to 89 years; retarded group (n=102); non-retarded group (n=116)	IQ scores (Range for retarded groups: 49 to 84)	Picture matching; emotion recognition in context	Positive
Lambert & Defays (1978)	30 retarded children, 8 to 10 yrs,; 30 non-retarded children 4 to 7 years	Academic achievement; IQ scores (Range of MAs for retarded groups: 4.1 to 7.2 years)	Picture identification	Positive
Putnam (1979)	111 retarded children, 5 to 14 years	IQ scores (Range 50 to 75)	Labeling & recognition of pictures	Positive

(Continued next page)

Table 1 (Continued)

Investigators	Sample	Cognitive Assessment	Decoding Task	Relationship
Gray, Fraser, & Leudar (1983)	26 retarded adults	IQ scores; mildly retarded group (M=69); severely retarded group (M=48)	Picture identification	Positive
Meikamp (1984)	83 retarded (Mean CA: 11.3 years & 120 nonretarded children (Mean CA: 10.1 yrs.)	Educational achievement; IQ scores	Picture identification	Positive
Reeves (1985)	10 moderately & 16 mildly retarded adult males	IQ scores	Recognition & labeling of pictures	Positive
Sogon & Izard (1985)	52 nonretarded & 12 retarded children	Educational achivement; IQ scores	Picture identification	Mixed
Shoup Thorson (1986)	64 mildly & moderately retarded adults	IQ scores	Speed of picture identification	Positive
Maurer & Newbrough (1987a)	32 retarded adults; 23 nonretarded adults	IQ scores (Mean IQ for retarded groups: 54.4)	Recognition & labeling of pictures	Positive

Table 2

Studies Investigating the Relationship Between Facial Affect Encoding Skill and Cognitive Ability in Mental Retardation

Investigators	Sample	Cognitive Assessment	Decoding Task	Relationship
Cicchetti & Sroufe (1976)	14 infants with Down Syndrome (18 mos. of age)	Infant cognitive development scales	Affective responses to various stimuli —— behavioral observations	Positive
Emde, Katz, & Thorpe (1978)	6 infants with Down Sundrome (3 1/2 months of age)	Age-matched with normal infant	Social smiling to various stimuli —— photographs	Positive
Maurer & Newbrough (1987a; 1987b)	8 retarded children (Mean CA: 7 years; Mean MA: 4.5 years); 8 non-retarded, 4 & 5 year old children	IQ scores	Posed facial expressions —— photographs	Positive

Appendix B

Consent Forms

Dear Employee:

I am a student and I am doing a school project at Morgan Memorial Goodwill Industries. I would like it if you would take part in the project but you do not have to do it.

If you decide to be in the project, you and I will meet 2 times for about 1/2 hour each time. I will pay you when you are away from your regular job at Morgan Memorial so you won't lose any money, and then I'll give you an extra $1 each time we work together. The first time I work with you, I will ask you to make five faces to show different feelings, and I will take your picture with a Polaroid camera. The camera makes the pictures very fast so you'll be able to see them right away. The second time we get together, I will show you your pictures as well as the pictures of some of the people you work with at Morgan Memorial and ask you some questions about their pictures.

There is another part to the project, but we will not have to work together for it. Your counselor at Morgan Memorial will see your pictures and fill out a form telling how you get along with others in the workshop. I will look at your records to get scores on some tests you've taken and to find out about the schools you went to, the places you have lived, and the jobs you have had before you came to Morgan Memorial. Four people who do not know you will also look at your pictures. I will not tell anyone your name, but I will give you a number in my project. When I am all finished, I will give your pictures back to you, and you can do whatever you want with them.

I have talked to your counselors and bosses at Morgan Memorial, and it is all right with them if you want to do the project, but it is

also all right with them if you do not want to do it. If you start working with me and don't want to finish, you can stop at any time by telling me, your counselor, your boss, or your guardian.

You have to sign a form to be in the project. Your guardian must also sign the form, but you do not have to do the project if you don't want to even though your guardian said that you would do it. If you don't have a guardian, you can take this letter and talk about it with your family or counselor before you sign it.

If you have any questions, tell your counselor or boss at Morgan Memorial that you want to talk to me, and they will give me the message.

Thank you.

Sincerely,

Felicia Wilczenski

Graduate Student

University of Massachusetts

Dear Guardian:

I am a graduate student at the University of Massachusetts, Amherst, studying the ability of adults with developmental disabilities to express and interpret facial expressions. This research will provide information about nonverbal behavior which may contribute to an understanding of the social/emotional functioning of persons with developmental disabilities and assist in designing social skills training programs. The study will be carried out at the Morgan Memorial Goodwill Industries in Beverly, Massachusetts, and I am now seeking participants.

If your ward takes part in the study, he or she will be reimbursed for time away from regular work at Morgan Memorial and also paid an extra $1 for each of 2 sessions of approximately 30 minutes required for the project. During the first session, a picture will be taken with a Polaroid camera as your ward poses five facial expressions. Those photos will be rated by co-workers at Morgan Memorial and, in turn, your ward will be asked to categorize their pictures during the second meeting. Four independent persons will also rate the photographs. Supervisors at Morgan Memorial will see the pictures and will complete a brief social skills assessment. Other information from employee records will be used, such as age, previous test scores, and educational, residential, and occupational histories.

The Research Review Committee and Dissertation Committee at the University of Massachusetts, as well as Morgan Memorial Goodwill Industries and the Massachusetts Department of Mental Health and Mental Retardation, have reviewed and cleared this research to assure that the rights of the participants have been recognized and protected.

Precautions will be taken to ensure privacy. Names will not be used in the study. Photographs will be coded by number. Background information from employee records and the scores obtained on the various tasks included in the project will be combined with those of all the participants so that an individual cannot be identified. The photographs will be returned to the participants and the results of the project will be available at Morgan Memorial Goodwill Industries when the study is completed.

A decision to participate or not to take part in the study will not affect any services provided to your ward by the Department of Mental Health and Mental Retardation and Morgan Memorial Goodwill Industries. A letter explaining this project to Morgan Memorial employees and a consent form are attached. Guardians must co-sign the permission form. Again, your ward is not required to take part in this study, and you or your ward may terminate participation at any time even though the consent form has been signed.

Please leave a message for me at: 922-1194 if you have any questions or comments about the study. I welcome your ward's participation.

Thank you.

Sincerely yours,

Felicia Wilczenski
Graduate Student
University of Massachusetts/Amherst

PROPOSED RESEARCH: Nonverbal Communication of Affect: Encoding and Decoding of Facial Emotional Expressions by Adults with Developmental Disabilities

INVESTIGATOR: Felicia L. Wilczenski

SPONSOR: University of Massachusetts, Amherst

I agree to be in a school project for Felicia Wilczenski which is being done at Morgan Memorial Goodwill Industries.

I will let my picture be taken and seen by other people who work with me at Morgan Memorial as well as by four people who do not know me. My name will not be used in the project. I will get my pictures back when the project is finished.

I know that my counselor will fill out a form about how I get along with others in the workshop. My records at Morgan Memorial will be looked at to get scores on tests that I've taken and to find out where I went to school, where I've lived, and where I've worked.

I will get paid for the time that I am away from my job at Morgan Memorial to do the project and get a bonus of $2 for 2 sessions.

I know that services from the Department of Mental Health and Morgan Memorial Goodwill Industries will be the same whether or not I do the project. My counselors and bosses at Morgan Memorial know about the project, and it is all right with them if I do the project but also all right if I don't do it.

I agree to be in this project. I know I will not get punished or get special favors whether I do or don't do the project. I have read or have had someone read this form and the attached letter about the project. I have had a chance to talk about the project and have my

questions answered. I know I can stop doing the project at any time even if my guardian said it was all right for me to be in the project.

_____ _____

Date Employee Signature

_____ _____

Date Signature of Legal Guardian

I have fully explained the above issues in a manner understood by the consenting party and answered all questions to the best of my ability. It is my opinion that consent has been given freely and knowingly.

_____ _____

Date Human Rights Officer

_____ _____

Date Witness

Appendix C

Socialization Scale

Socialization Scale/Domain 9

AAMD Adaptive Behavior Scales

CTB/McGraw-Hill, 2500 Garden Road,

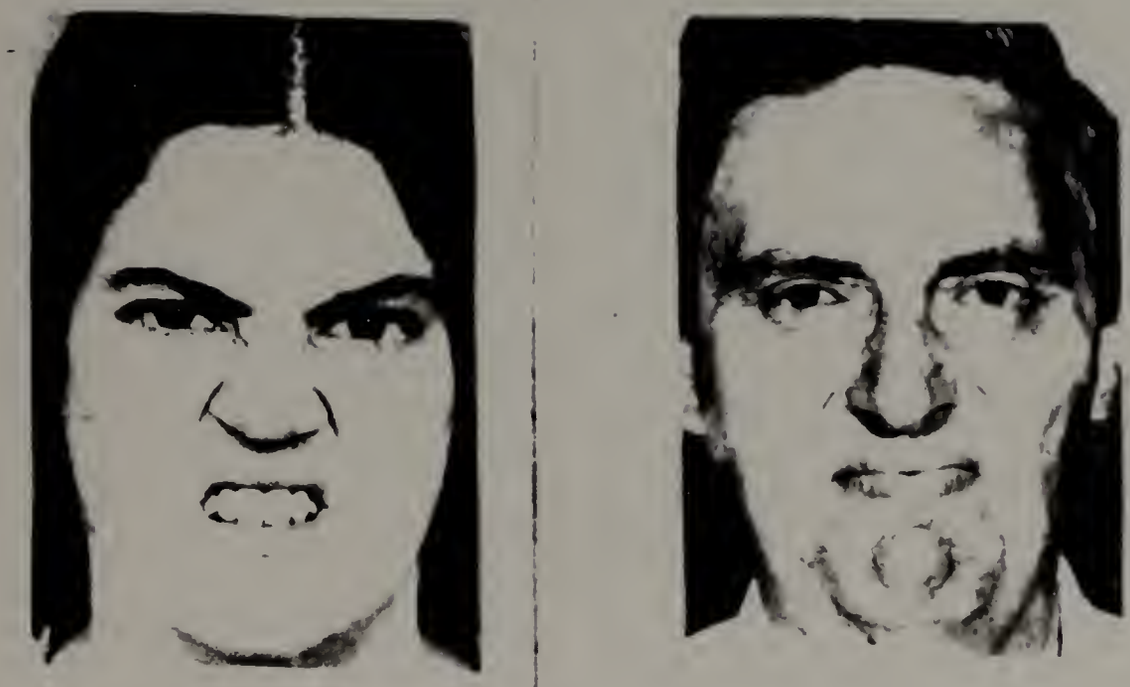
Monterey, California 93940

Refer to Socialization Scale/Domain 9

AAMD Adaptive Behavior Scales

Appendix D

Practice Item



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Appendix E

Statistical Tables

TABLE 3

Means, Standard Deviations, and t-Test Results

for Males and Females on Encoding and Decoding Tests

Variables	Male n=19		Female n=33			
Encoding Scores	M	SD	M	SD	t'	p*
Immediate Self-Assessment	2.11	.99	1.82	1.1	- .95	.345
Delayed Self-Assessment	2.26	1.05	1.73	1.21	-1.62	.112
Peer Ratings	35.74	10.35	35.03	8.69	- .26	.794
Familiar Judge Ratings	1.32	.95	1.18	.95	- .49	.626
Independent Judge Ratings	1.21	.92	1.24	.87	.13	.901
Decoding Scores						
Peer Decoding	35.00	7.36	35.42	8.54	.18	.857

*2-tailed probability

't-Test for correlated means

TABLE 4

Means, Standard Deviations, and t-Test Results

for Peer Decoding Accuracy of Specific Emotional Expressions

Variable	N	M	SD	t	p#
Happiness	52	14.08	3.71	12.6	.00*
Sadness		8.44	2.48		
Happiness	52	14.08	3.71	13.73	.00*
Anger		6.85	2.12		
Happiness	52	14.08	3.71	17.83	.00*
Fear		5.90	2.48		
Sadness	52	8.44	2.48	4.51	.00*
Anger		6.85	2.12		
Sadness	52	8.44	2.48	6.36	.00*
Fear		5.90	2.48		
Anger	52	6.85	2.12	2.64	.00*
Fear		5.90	2.48		

2-tailed probability

* $p < .01$

TABLE 5

Number and Percent of Subjects with Each Possible Pose or Pose Combination Correct

Number of Correct Poses (75% Agreement Criteria)	Possible Pose Combinations	Percent Pose Combinations Correct	Number of Subjects
0 (n=16)	---	---	16
1 (n=22)	Happiness	77%*	17'
	Sadness	18%	4
	Anger	0	0
	Fear	.05%	1
2 (n=12)	Happiness/Sadness	67%*	8"
	Happiness/Anger	17%	2
	Happiness/Fear	0	0
	Sadness/Anger	17%	2
	Sadness/Fear	0	0
	Anger/Fear	0	0
3 (n=2)	Happiness/Sadness/Anger	50%	1
	Happiness/Anger/Fear	0	0
	Happiness/Sadness/Fear	50%	1
	Sadness/Anger/Fear	0	0
4 (n=0)	Happiness/Sadness/Anger/Fear	---	---

* $p<.05$

' $x = 17.22$
$Z = 4.15$

" $x = 5.9$
$Z = 2.43$

TABLE 6

Means, Standard Deviations, Correlation Coefficients, and t-Test Results on Encoding and Decoding Tasks

Variables	N	M	SD	r	p#	t'	p#
Total Facial Affect Encoding Scores Assigned by Peers	52	35.29	9.24	.322	.02*	.01	.989
Total Scores for Decoding Facial Affect of Peers		35.27	8.06				

' t-Test for correlated means

2-tailed probability

* $p<.05$

TABLE 7

Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Ratings of Familiar and Independent Judges

Variable	N	M	SD	r	p	t#	p
Familiar Judges Total Score	52	7.29	3.08	.75	.000*	1.77	.002
Independent Judges Total Score		6.75	3.12				

t-test for correlated means

* $p<.01$

TABLE 8

Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Affect Identification Scores for Retarded and Nonretarded Raters

Variables	N	M	SD	r	p#	t'	p#
% Independent Raters Scores	52	42.19	19.49	.644	.000*	3.26	.002*
Peer Scores		35.29	9.24				
% Familiar Raters Scores	52	45.55	19.23	.673	.000*	5.04	.000*
Peer Scores		35.29	9.24				

' t-test for correlated means

2-tailed probability

* $p < .01$

TABLE 9

Means, Standard Deviations, Correlation Coefficients, and t-Test Results for Immediate and Delayed Self-Assessments

Variables	N	M	SD	r	p#	t'	p#
Immediate Self-Assessment Test	52	1.92	1.05				
				.364	.004*	0	1.00
Delayed Self-Assessment Task	52	1.92	1.17				

' t-Test for correlated means

2-tailed probability

* $p<.01$

TABLE 10

Means, Standard Deviations, and t-Test Results

for Self-Assessments and Encoding Scores Assigned by Peers

Variables	N	M	SD	t	p
Self-Assess: Happiness					
Correct Peer Judgments	38	15.68	5.57	-3.50	.001*
Incorrect Peer Judgments	14	9.64	5.37		
Self-Assess: Sadness					
Correct Peer Judgments	26	10.04	3.42	-2.93	.005*
Incorrect Peer Judgments	26	7.00	4.04		
Self-Assess: Anger					
Correct Peer Judgments	21	8.14	2.73	-2.11	.04*
Incorrect Peer Judgments	31	6.16	3.67		
Self-Assess: Fear					
Correct Peer Judgments	16	6.19	2.97	-.82	.414
Incorrect Peer Judgments	36	5.56	2.35		

* $p<.05$

TABLE 11

Means, Standard Deviations, and t-Test Results

for Nonverbal Communication Abilities and Adaptive Functioning

Variables		N	M	SD	t	p
Decoding	Institutional History	10	34.2	7.2	.46	.645
	No Institutional History	42	35.5	8.31		
Encoding	Institutional History	10	38.6	11.54	-1.27	.210
	No Institutional History	42	34.5	8.58		
Decoding	Community Residence	24	33.8	8.72	1.23	.225
	Residing with Family	28	36.54	7.38		
Encoding	Community Residence	24	36.54	10.28	-.90	.370
	Residing with Family	28	34.21	8.29		
Decoding	Sheltered Work	37	34.3	8.6	-1.38	.175
	Semi-Competitive	15	37.7	6.15		
Encoding	Sheltered Work	37	35.3	10.19	-.022	.983
	Semi-Competitive	15	35.3	6.6		

TABLE 12

Descriptive Statistics and Multivariate/Univariate Analyses of Variance for Measures of Cognitive Ability, Social Skills, Nonverbal Communication Abilities, and Age for Subjects According to Psychiatric History

Variables	Ss with Psychiatric Hx (n=12)		Ss without Psychiatric Hx (n=40)		MANOVA				ANOVA		
	M	SD	M	SD	Wilk's λ	F	df	p	F	df	p
					.77054	2.7397	46	.03*			
Decoding Score	39.92	5.55	33.88	8.23					5.659	50	.02*
Encoding Score	33.67	12.03	35.78	8.35					.476	50	.49
Socialization Score	19.58	3.73	18.98	4.07					.214	50	.65
IQ Score	60.92	15.45	54.63	12.78					2.030	50	.16
Age	37.5	10.01	34.13	10.35					.997	50	.32

* $p < .05$

TABLE 13

Matrix of Standardized Regression Coefficients

for Nonverbal Communication Variables

	Decoding	Encoding	Social Skills
Cognitive Ability	.35*	.10	-.09
Decoding		.29*	.21
Encoding			.24

*p<.05

TABLE 14

Decomposition of Bivariate Relationships

Bivariate Relationships of Concern	Causal		
	Direct	Indirect	Total
X3 X4 Decoding/IQ	.35	None	.35
X2 X4 Encoding/IQ	.1Ø	(P34) (P23) (.35) (.29) =.1Ø	.2Ø
X1 X4 Social Skills/IQ	-.Ø9	(P34) (P23) (P12) +(P34) (P13) +(P24) (P12) (.35) (.29) (.24) +(.35) (.21) +(.1Ø) (.24) =.11	.Ø2
X2 X3 Encoding/Decoding	.29	None	.29
X1 X3 Social Skills/Decoding	.21	(P23) (P12) (.29) (.24) =.Ø7	.28
X1 X2 Social Skills/Encoding	.24	None	.24

Appendix F

Subject Photos

Happiness

Sadness

Anger

Fear

Figure 2: Photos of Subjects Who Successfully Posed the Requested Facial Expressions

Happiness

Sadness

Anger

Fear

Figure 3: Photos of Subject Unable to Pose Requested Facial Expressions

Happiness

Sadness

Anger

Fear

Figure 4: Photos of Subject Unable to Pose Requested Facial Expressions

REFERENCE NOTES

1. Similar stories have been used in other studies of emotion recognition among retarded and nonretarded children and adults (e.g., Camras et al, 1983; Gray et al, 1983; Meikamp, 1984).

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