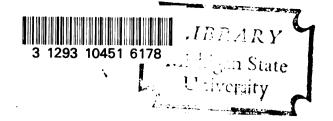LABELING AND RECOGNITION OF
IZARD'S FACIAL EXPRESSIONS
BY THREE AGE GROUPS

Dissertation for the Degree of Ph. D.
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MARGARET ZERBA
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This is to certify that the

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Labeling and Recognition of Izards'
Facial Expressions by Three Age Groups

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Margaret Zerba

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ABSTRACT

LABELING AND RECOGNITION OF
IZARD'S FACIAL EXPRESSIONS
BY THREE AGE GROUPS

By

Margaret Zerba

The purpose of this study was twofold: to compare
the emotion recognition and labeling behaviors of three
age groups, 18-35, 35-60, and 60+, and genders within these
age groups to Izard's (1971) 32 photographs of facial
expression; and to compare the attitudes of these age groups
to the eight emotion categories depicted in these photo-
graphs. The eight categories were: interest-excitement,
enjoyment-joy, surprise-startle, distress-anguish, disgust-
contempt, anger-rage, shame-humiliation, and fear-terror.
Modifications of Izard's Emotion Labeling Experiment,
Emotion Recognition Experiment, and Emotion Attitude
Questionnaire were administered individually to subjects
within the same one-and-one-half-hour sitting.

The Hoyt (1941) Homogeneity Reliability was performed
to assess the homogeneity of the four photographs/items with-
in each of the eight categories. A coefficient of .40 was
the lowest acceptable homogeneity coefficient. The shame-
humiliation items on the Recognition Test received the
highest coefficient, and the distress-anguish items on the
Labeling Test received the lowest coefficient (indeterminate).

A discrepancy between a low coefficient for the four enjoyment-joy items on the Recognition Test and high mean scores for the same items on this test resulted in a decision to perform additional assessments for the reliability of items within categories. Percentage of subject agreement for categories and items within categories, as well as patterns of correct and incorrect score combinations for items within each category, were explored. Items within the interest-excitement and enjoyment-joy categories received the highest percentage of correct responses for both tests. A factor analysis with no assumptions about expected factor structure and factor analyses preset to eight, three, and two factors were performed for both tests. The results of the factor analyses did not reflect the eight a priori categories nor did they reflect the three and two factor classifications.

A multivariate analysis of variance was performed for an age group main effect with planned comparisons for a gender within age group effect for the Labeling and Recognition Tests. Hypotheses were tested at a .05 alpha level. Scheffé Post-Hoc Comparisons with alpha set at .00625 were performed to assess age group mean score differences resulting from the MANOVA and univariate analyses on both tests. The three age group mean scores were found to be significantly different on the distress-anguish variable for both tests. The 18-35 group received the highest mean scores, and the 60+ group received the lowest mean scores. The MANOVA with

planned comparisons resulted in no significant gender within age group differences for all three age groups on both tests. A Chi-Square Test of Independence with alpha set at .05 was performed to assess whether age and emotion were independent for each of the 10 questions on the Emotion Attitude Questionnaire. Significant age group differences occurred for Question 10: How well do you understand yourself, your own personality? The 60+ group reported that they understood themselves and their own personalities to a lesser degree than the other two groups. The 18-35 group reported to understand themselves to a greater degree than the other two groups. A Chi-Square Test of Independence was performed with alpha set at .05 to assess age group distributions between "emotion experienced most frequently" as reported on the Emotion Attitude Questionnaire and emotion category with the highest in the Emotion Recognition Test. A Chi-Square Test of Independence was performed with the same alpha level to assess age group distributions between "emotion experienced least frequently" as reported on the Emotion Attitude Questionnaire and emotion categories with lowest score on the Emotion Recognition Test. No significant age group differences were found for the latter two Chi-Square Tests.

LABELING AND RECOGNITION OF

IZARD'S FACIAL EXPRESSIONS

BY THREE AGE GROUPS

By

Margaret Zerba

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To my sister, Debbie.

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The following people were available, supportive, and understanding when I needed them the most: Bill Clephane, Bob Wilson, Judith Taylor, Bill Hinds, Imogen Bowers, Judith Carman, Margaret Parsons, the Test Administrators, and the Labeling Test Raters.

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Ce n'est pas un bestseller, mais
ce qui ressemble le plus au "rock
and roll."

Chapter I

THE PROBLEM

Introduction

Izard (1971) defines <u>facial patterning</u> or facial

expression in the following manner:

> . . . it may be helpful at the outset to say
> something about the meaning of the term <u>facial</u>
> <u>patterning</u> or facial expression as used <u>in this</u>
> <u>book.</u>   <u>It</u> does not mean merely something that
> happens as a <u>result</u> of the subjective experience
> or an emotion;<u>that</u> is, it is not merely
> expressive behavior.   Rather, it is a pattern of
> neuromuscular activity that constitutes a com-
> ponent of emotion.   Like all activity patterns,
> it has specific meaning and relationships with
> particular antecedents and consequents.   It is
> expression, mainly in the sense that it communi-
> cates something both intra-psychically and
> socially.

Descriptions of facial expressions depicting certain

affects dates back as early as 1667 when the painter LeBrun

published "Conferences," a work containing some remarks

describing the facial expression of fright. Camper (1792),

Bell (1806, 1844), Piderit (1859), and Burgess (1839)

followed LeBrun with detailed descriptions of the movements

of the facial muscles which accompany different affects.

Duchenne (1862) was the first to publish photographs of

the intricate movements of facial muscles. Darwin (1872)

reports that he showed several of Duchenne's photographs to more than 20 males and females of different ages, asking them to label any emotions which they saw in the photos. Darwin found discrepancies among his subjects in terms of the labels which they used to describe the pictures. Darwin's labeling experiment could be considered an un- sophisticated forerunner of the Emotion Labeling Experiment developed by Izard (1971). Izard used an Emotion Labeling Experiment and an Emotion Recognition Experiment to cross-culturally validate 32 photographs of facial expression for eight emotion categories. The eight emotion categories were interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, disgust-contempt, anger-rage, shame-humiliation, and fear-terror (Izard and Tomkins, 1966; Tomkins, 1962). Subjects generated their own emotion labels for the photographs during the Emotion Labeling Experiment, while the Emotion Recognition Experiment consisted of subjects matching one of the eight given labels with each of the 32 photographs. In addition to responding to the labeling and recognition experiments, subjects answered questions regarding their attitudes toward the eight emotion categories (Emotion Attitude Questionnaire). Izard's cross-cultural recognition experiments resulted in a better than chance agreement among subjects for the 32 photographs and the eight categories. He found less agreement among sub-jects for responses to the Emotion Labeling Experiment, and

the answers to the Emotion Attitude Questionnaire produced the least percentage of agreement among subjects.

Izard also investigated male-female differences in terms of percentage of agreement for the labeling experiment. Females across cultures were in greater agreement for labels used to describe the photographs than males.

Need

Although Izard's cross-cultural studies indicate that females scored slightly higher than males for the labeling of facial expression, research on sex differences and the identification of facial expression has not produced consistent and conclusive results. Most research within this area has either resulted in no sex differences (Black, 1969; Allport, 1924; Guilford, 1929) or sex differences favoring females as more accurate than males in identifying certain affects (Kozel, 1969).

Exploring the attitudes and personal experiences of perceivers of facial expression and how their attitudes relate to their perceptions is a relatively new area of study. Izard used an Emotion Attitude Questionnaire to assess cross-cultural attitudes toward the eight categories (Izard, 1971). However, he did not study the relationship between attitudes of individual subjects and their performance in identifying the photographs. Schiffenbauer (1974) found that the emotional state of the perceiver of

facial expression influenced his judgments of the photographs of facial expression.

Izard's subjects for the cross-cultural studies ranged in age from 18-30; he did not investigate age as a factor influencing responses to the photographs. Most researchers who have investigated age differences as a factor in the labeling and recognition of facial expression have been concerned primarily with developmental differences among children and adolescents. Developmental studies with children and adolescents indicate that accuracy of labeling and recognition increases with age (Izard, 1971; Kwint, 1934; Gates, 1925).

The present study examined how the age, sex, and attitudes of a perceiver affect perceptions of emotion in facial expressions. The population of interest was divided into three age groups: 18-35, 35-60, and 60+ (Havighurst, 1956) for the purpose of the present study. Havighurst's model of developmental tasks focuses on the intellectual, physical, and social tasks associated with six stages of growth from infancy to later life. Izard's cross-cultural validation studies for the photographs and emotion categories used in the present study included subjects from 18-30 years of age. Havighurst's model provides a comparison group for Izard's study and supplements his research in terms of age range.

Problem Statement

At present, research regarding how sex differences affect the perception of facial expression of emotion is conflictual, whereas research investigating adult age group differences is nonexistent. Exploring attitude differences is relatively new in the area of perception of facial expression of emotion.

In addition to the need for more information regarding factors which affect the perception of facial expression of emotion, there appears to be a need also to discover a viable tool for assessing these differences and similarities.

Purpose

The purpose of this study was twofold: to compare the emotion recognition and labeling behaviors of three age groups, 18-35, 35-60, and 60+, and genders within these age groups to photographs of facial expressions; and to compare the attitudes of these age groups toward the eight emotion categories depicted in those photographs.

Rationale

Researchers who have been active in the development and classification of photographs of facial expression have also contributed to a theory of emotion. Tomkins (1962; 1963) contends that facial expression and emotion are

synonymous (Tomkins, 1962; 1963). Izard advocates that facial expression is a component of the emotion process and that facial muscles are most important in the differentiation and communication of emotion (Izard, 1971). If one accepts the assumption that facial expression of emotion is universal, as well as an important aspect of the communication process, further research will contribute to the understanding of the emotion process and will assist in the communication of that process interpersonally.

Information derived from investigating age as a factor in identifying facial expressions will be useful within the context of a helping relationship where individuals of different ages learn various ways of recognizing their own and others' feelings. Exploring the attitudes and personal experiences related to the identification of facial expression will provide information on how personality differences affect the perception of facial expression. Examination of sex as a factor related to the perception of facial expression may clarify the contradictory and inconclusive results which have already been obtained in this area. Hopefully, the present study will provide further insight into how age, sex, and attitudes of the perceiver affect and reflect the perception of facial expression and emotion.

General Hypotheses

1. There will be no differences between the three age groups for responses to the Emotion Labeling Test.

2. Females within all three age groups will score a higher number of correct responses on the Emotion Labeling Test than will males within all three age groups.

3. There will be no differences between the three age groups for responses to the Emotion Recognition Test.

4. Females within all three age groups will score a higher number of correct responses on the Emotion Recognition Test than will males within all three age groups.

5. There will be no differences between the three age groups for responses to the Emotion Attitude Questionnaire.

6. There will be no differences between the three age groups for agreement between emotion reported to be experienced most frequently and emotion category with the highest score on the Emotion Recognition Test.

7. There will be no differences between the three age groups for agreement between emotion reported to be experienced least frequently and emotion category with the lowest score on the Emotion Recognition Test.

Definition of Terms

The following terms are defined for their use in
this study.

1. Facial expression - a pattern of neuromuscular
   activity that constitutes a component of the
   emotion process (Izard, 1971).

2. Emotion category - one of eight emotion categories
   defined by Tomkins (1962; 1963) and Izard
   (1971): Interest-Excitement (IE), Enjoyment-
   Joy (EJ), Surprise-Startle (SS), Distress-Anguish
   (DA), Disgust-Contempt (DC), Anger-Rage (AR),
   Shame-Humiliation (SH), and Fear-Terror (FT).

3. Photographs of facial expression - a set of 32
   posed photographs of facial expression which have
   been cross-culturally matched with eight emotion
   categories; there are four photographs depicting
   each of the 8 emotion categories.

4. Slides of facial expression - 32 numbered slides
   made from the 32 photographs of facial expression.

5. Emotion Labeling Test (ELT) - a test devised by
   Izard (1971) to survey the emotion labels generated
   by subjects to describe the 32 photographs of
   facial expression.

6. Emotion Recognition Test (ERT) - a test devised
   by Izard (1971) to study the emotion labels
   chosen by subjects (from a set of categories

provided) to describe the 32 photographs of facial expression.

7. <u>Emotion Attitude Questionnaire (EAQ)</u> - a questionnaire created by Izard (1971) to study the attitudes of subjects toward the eight emotion categories.

8. <u>Emotion labeling behavior</u> - free response labeling of photographs of facial expression.

9. <u>Emotion recognition behavior</u> - selecting from a set of eight emotion categories a label which matches each photo of facial expression.

10. <u>Emotion attitudes</u> - answers to questions regarding personal experiences and attitudes regarding the eight emotion categories.

Delimitations

Izard's Emotion Labeling Experiment, Emotion Recognition Experiment, and Emotion Attitude Questionnaire were modified for the purposes of the present study. The format and wording of the directions for the labeling and recognition tests were changed to clarify the nature of the tasks. A maximum of 60 seconds for viewing and responding to each slide was added to the procedures for the labeling test. All subjects were given 60 seconds. This was done to insure that subjects from the 60+ group would have adequate time to respond to the slides, without allowing them more time than the other two groups.

Only six of Izard's original questions were used on the Emotion Attitude Questionnaire included in this study. The original questions which were omitted were: "Which is your 3rd most preferred emotion?" "Which is your 4th most preferred emotion?" "Which negative emotion do you experience most frequently?" "Which negative emotion do you experience least frequently?" "Which emotion do you understand the best?" and "Which emotion do you understand the least?" Four questions were added to the six remaining original questions: "Which emotion do you assume others see you experience most frequently?" "Which emotion do you assume others see you experience least frequently?" "Which emotion do you experience most frequently?" and "Which emotion do you experience least frequently?"

Izard's cross-cultural findings were based on data collected from subjects who were tested in groups. The present study involved individual testing of subjects. Photographs used in this study were photographs of Caucasians, and they were posed, not spontaneous. The categorization of emotions used in this study is only one of several popular contemporary categorizations; labeling and recognition of emotion is confined to Izard's eight emotions only.

The majority of subjects who participated in this study were single, not working, college graduates, with a gross family income of more than $15,000. Subjects

representing all three age groups were not typical of most individuals within these age groups in the United States, especially the 60+ age group.

All findings in this study must be interpreted within the confines of the above delimitations.

Summary

In Chapter II the literature pertinent to the area of facial expressions and emotions will be reviewed. In Chapter III the design and analysis of the data will be described, including selection of the sample, testing of the sample, analysis of the measures used, and specific hypotheses to be tested. In Chapter IV the analysis of the data will be presented, and in Chapter V the results of the study will be discussed and the conclusions will be reviewed along with considerations for future research.

Chapter II

REVIEW OF THE LITERATURE

The review of the literature will be organized in the
following manner: a summary of the historical development
of photographs and labels of facial expression; research
supporting the universal theory of emotion; blind and
sighted studies; age and developmental studies; age and sex
differences in perceiving facial expressions of emotion;
and personality characteristics related to the perception
of facial expression.

Historical Development of Use
of Photographs and Labels

Duchenne published the first photographs of facial
expression in 1862 (Darwin, 1872). Duchenne's photographs
were posed by one subject. Darwin used these photographs
to conduct the first emotion labeling experiment. In
addition to his own experiments and observations, Darwin
collected observations of facial expression made by
correspondents from around the world. Darwin categorized
facial expression with the labels: love, mirth, happiness,
surprise, fear, suffering, anger, determination, disgust,

and contempt. Feleky (1914) conducted the first systematic study of the emotion recognition of facial expression. Feleky posed for several hundred photographs, attempting to portray specific emotions. Subjects were presented with 86 numbered photographs and a list of over 100 names of emotions. Subjects were asked to select the emotion names and numbers which fit with the photographs. Most of her subjects were not in agreement on the labels they selected.

Langfeld (1918) studied interpretations of 105 of the Rudolph (1903) pictures, sketches made from photographs of an actor posing. Langfeld showed the pictures to six judges, four men and two women, on three different occasions. For the first two showings, Langfeld asked judges to write an explanation of the emotions portrayed. For the third administration, Langfeld showed the same pictures accompanied by the name of the emotion depicted in the sketches. Judges were allowed to either choose the emotions intended by the artist who made the sketches or to retain their original impressions. The judges were more consistent on the first two administrations and frequently did not discriminate their own judgments from judgments of other judges on the third. With the exception of contempt and disdain sketches, Langfeld's results indicated that judges tended to be consistent. Langfeld's study gives an account of the process which judges reported

to experience while viewing the sketches: imagining situations which might have elicited the emotions, facial imitation of the sketches, and association with personal experiences.

In another study, Ruckmick (1921) employed the posed photographs of one female actress to conduct the first study involving judgments of the top and bottom halves of the face. He considered the emotions posed as primary emotions, viz., love, hate, joy, and sorrow, or secondary emotions (surprise, distrust, repulsiveness, and defiance). Although he was one of the first researchers to distinguish between two major categories of emotion, his research is better known for evidence indicating that the mouth/bottom half of the face is superior to the top half in terms of providing information about the facial expression to the observer.

The manipulation of the environment for the development of photographs of facial expression was first attempted by Landis (1924a,b). Landis presented a series of controlled stimuli to subjects in order to photograph their reactive facial expressions. He concluded that (1) there was no relationship between stimuli and facial expressions displayed, and (2) that there were no distinct facial patterns or expressions characteristic of particular feelings. Landis' statistical procedures and conclusions were later discredited (Davis, 1934), rendering another

study by Landis (1929), which included some of those
photographs, invalid.

Until Frois-Wittman's research, it appeared that
results from most research involving the identification of
facial expression was confounded by the stimuli and method-
ology used by the researcher. Some form of categorization
of emotion labels was also needed. Frois-Wittman (1930)
compared judgments of the whole face with those of the top
of the face and the mouth by asking 165 observers to judge
227 stimuli with the use of 43 emotion terms. The stimuli
were posed photographs and drawings of the researcher's
facial expressions. Thirty-two emotion terms used most
frequently by observers: hate-anger, disappointment-
sadness, disgust-contempt, and horror-fear, were terms
which were used concurrently and interchangeably most often
by observers. Frois-Wittman's contributions included:
empirical data indicating correspondence between muscle
movements and emotion labels used by observers; a classi-
fication system for judging facial expressions; and the
importance of the relativity of particular muscular move-
ments to the whole muscular pattern in the display of
facial affect.

Woodworth (1938) addressed the problem of judging
facial expression by presenting a six-step linear scale
for the classification of facial expression: (1) love,
happiness, mirth; (2) surprise; (3) fear, suffering;

(4) anger, determination; (5) disgust; and (6) contempt.
He found high correlations between photographs and judgments
made by observers for data collected by Feleky (1914),
Ruckmick (1921) and Gates (1927). Schlosberg (1941)
studied Frois-Wittman's (1930) photographs and Woodworth's
(1938) six-step scale;he derived two underlying variables
for the classification of photographs: pleasantness-
unpleasantness and attention-rejection. He concluded
that the 6-step scale by Woodworth existed on a continuum
for those two variables.

The development of categories and classification
systems for photographs resulted in: improved quality of
muscle distinctions portrayed in photographs; and the
discovery of theoretical constructs which could be
investigated.

Major categorizations of emotion since Schlosberg
employed in research today are those of Plutchick (962),
Tomkins (1962, 1963), Izard (1971) and Ekman (1972).
Plutchick distinguishes between primary or pure emotions
and secondary or mixed emotions. He considers the primary
emotions to be: acceptance, disgust, anger, fear, joy,
sorrow, startle, expectation or curiosity. Tomkins con-
siders three categories: positive, negative, and resetting.
The positive emotions are enjoyment-joy and interest-
excitement; the negative are distress-anguish, disgust-
contempt, anger-rage, shame-humiliation, and fear-terror.

The third emotion, surprise-startle, is considered a resetting emotion. Izard's (1971) research focuses on eight distinct and discrete emotion categories from Tomkins (1962, 1963). He has also developed 32 photographs which have been cross-culturally matched for those eight categories. A more detailed description of Izard's assumptions and methods is presented in the next section. Ekman's (1972) literate and preliterate studies are based on six emotions: surprise, fear, sadness, disgust, anger, and happiness. Ekman (1972) and Izard (1971) have conducted research which has produced the most empirical results supporting the universality of various facial affects.

The Universal Theory of Emotion

Researchers usually emphasize one of three different viewpoints when studying the relationship between facial expression and emotion: the universal theory, the culture-specific theory, or some combination of both. Most universalists contend that the same facial muscular movement is associated with the same emotion in all races of mankind through inheritance. Culture-specific theorists maintain that facial expression of emotion is akin to language and learned within each culture, having meaning only within the culture in which it is learned. "Neuro-cultural," a term coined by Ekman and his associates, is used to describe a viewpoint which explains facial expression as having both universal and specific cultural determinants (Ekman, 1971).

Darwin's research and acquisition of observations of facial expression from correspondents around the world constituted the first attempt to study the cross-cultural similarities in facial expression among peoples. Darwin accepted the idea that facial expression of emotion was universal and inferred that it was also inherited.

During the last 10 years, the bulk of research on the relationship between facial expression and emotion has been directed toward supporting or disproving the universal theory of the facial expression of emotion. Cross-cultural studies by Izard (1971) and studies of preliterate cultures by Ekman (1972) lend support to the universal theory of emotion.

The major distinctions between Ekman's and Izard's research are as follows: Ekman's research includes six instead of eight emotions: surprise, fear, sadness, disgust, anger, and happiness. Ekman's research methods include primarily the use of a recognition or matching of labels with photographs task. Ekman's theory includes details on cultural determinants of facial expression as well as universal determinants.

Ekman's Literate and Preliterate Studies

Ekman's theory is referred to as "neuro-cultural" (Ekman, 1972). "'Neuro' refers to the facial affect program--the relationships between particular emotions and a particular pattern of facial muscles. 'Cultural' refers to the other set of determinants--most of the events which

elicit emotion, the rules about controlling the appearance of emotion, and most of the consequences of the emotion" (Ekman, 1972, p. 5). According to Ekman, certain elicitors, either personal or non-personal, activate the feelings and associated facial muscles which are then regulated by display rules which alter the way in which feelings are expressed facially (Ekman, 1972).

Ekman studied the cross-cultural similarities in identification of facial expression by showing photographs of facial expression to students in five literate cultures-- Japan, United States, Brazil, Chile, and Argentina. The six emotions studied were happiness, sadness, anger, fear, surprise, and disgust. Ekman's purpose in studying responses to the photographs was to show that the same facial emotions can be identified with a high percentage of agreement cross-culturally. The photographs used by Ekman were both posed and spontaneous, and of children and adults. The sources for the photographs were photographs used in studies of facial expression from 1930 to 1966, including the Frois-Wittman (1930) photographs, photographs of mental patients (Ekman and Friesen, 1968), and others (Engen, Levy and Schlosberg, 1957; Tomkins and McCarter, 1964). Particular care was taken to exclude photographs which depicted blends of emotion categories. Results for the five sets of cultural responses were supportive of the universal theory. Percentage of agreement

for recognizing responses is found in Table 2.1. Subjects responded to the photographs by matching words provided in their language with the photographs.

Table 2.1

Percentage of Agreement Across Five Literate
Cultures for Six Emotion Categories

Category	U.S.	Brazil	Chile	Argentina	Japan
	N-99	N-40	N-119	N-168	N-29
Happiness	97	95	95	98	100
Disgust	92	97	92	92	90
Surprise	95	87	93	95	100
Sadness	84	59	88	78	62
Anger	67	90	94	90	90
Fear	85	67	68	54	66

In addition to studies involving literate cultures, Ekman and associates conducted four experiments with pre-literate cultures. For the first experiment in New Guinea and Borneo, subjects were given several photographs and listened to stories told by the experimenter (Ekman, Sorenson, and Friesen, 1969). Subjects were expected to pick a photograph which matched a story about an emotion. The second culture study involved subjects from New Guinea, the Tore, who were given several photographs and asked to pick a photograph which depicted the emotion associated

with the story (Ekman and Friesen, 1971a). For the third experiment, New Guineans who did not participate in the previous experiment were asked to pose an expression imagined on the basis of a story told to them. The pictures posed by the New Guineans were shown to American college students unfamiliar with the culture, and all were judged with a high degree of accuracy. This study with the New Guinean posed photographs illustrated that they were equally able to pose and identify the six emotions, with the exception of fear, which is closely associated with surprise for this culture.

The fourth experiment was conducted with another preliterate group inhabiting New Guinea, the Danis. Ekman trained a couple, who worked with the Dani, to present photographs and stories to them to study how well they matched the stories with the photographs. The results of the fourth and previous experiments were consistent: preliterate culture groups selected on the basis of their minimal contact with Caucasians and Western civilization were in agreement with judgments of literate subjects at least 79 percent of the time for five of the emotions. Lowest agreement was for the fear category, which was often associated with surprise.

Izard's Categories, Photographs, and Cross-Cultural Studies

This section includes a summary of the development of the a priori definitions for the eight emotion categories and the 32 photographs of facial affect by Izard. A brief description of how Izard used the categories and photographs in conjunction with the three tests used in this research is also included.

A Priori Definitions for the Eight Categories

The eight emotion categories--interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, disgust-contempt, anger-rage, shame-humiliation, and fear-terror--were defined by Tomkins (1962; 1963) and Izard (1971). These categories were supplemented by additional definitional terms through the following process. Three judges selected terms which fit into the eight categories by using the Allport and Odbert (1936) lexicon. Terms selected were then submitted to judges familiar with the eight categories. Words agreed upon by 8 out of 10 judges were used for a pilot study with photographs developed by Tomkins (Tomkins and McCarter, 1964). On the basis of this pilot study, ambiguous or difficult terms were eliminated. Some new terms were added from free responses given by judges during a second pilot study with the same photographs. Terms derived from both pilot studies were presented to five judges familiar with the categories. Terms agreed upon unanimously by the judges were retained and are reported in Table 2.2.

Photographs of Facial Expression

The process of selecting four Caucasian photographs to represent each of the eight emotions was influenced initially by a compilation of descriptions of nine emotional expressions: interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, disgust- revulsion, contempt-scorn, anger-rage,

Table 2.2

Eight Emotion Categories and Their
A Priori Definitions

Category	A Priori Definitions
Interest-Excitement	Concentrating, attending, attracted, curious
Enjoyment-Joy	Glad, merry, delighted, joyful
Surprise-Startle	Sudden reaction to something un-expected, astonished
Distress-Anguish	Sad, unhappy, feels like crying
Disgust-Contempt	Sneering, scornful, disdainful, revulsion
Anger-Rage	Angry, hostile, furious, enraged
Shame-Humiliation	Shy, embarrassed, ashamed, guilty
Fear-Terror	Scared, afraid, terrified, panicked

shame-humiliation, and fear-terror. The categories disgust-revulsion and contempt-scorn were later combined by Izard to construct the disgust-contempt category. Izard's compilation is presented in Table 2.3.

Graduate and undergraduate students who participated in a previous study posed six of the Woodworth emotion categories (Woodworth, 1954). The 1,000 posed photos were presented to three judges for goodness of fit with the categories. Those photos agreed upon by two out of three judges were later categorized by 30 new subjects, yielding 16 photographs. The 16 photographs were further categorized

Table 2.3

The Facial Features and Movements Involved

in Each of the Nine Fundamental Emotions

Emotion	Feature	Position or Movement
Interest-Excitement	Eyebrows	Slightly lifted or slightly lowered
	Eyes	May be exaggeratedly opened and fixated. Lower eyelids may be raised as though to sharpen visual focus.
	Mouth	Lips may be parted; underjaw may be dropped slightly.
Enjoyment-Joy	Eyebrows	Slightly lowered, forehead relatively smooth.
	Eyes	Bright, partially closed (more exaggerated in laughing). Wrinkles formed in outer corners.
	Mouth	Corners lifted. In smiling may be closed or slightly opened; in laughter, corners pulled back and up. Teeth show; upper lip is tense. Nasolabial grooves appear.
	Cheeks	Raised, pushing up lower eyelid, making face seem shorter and broader.
	Nose	May appear to elongate and taper, or nose wrinkles may appear.

Table 2.3 (Continued)

Emotion	Feature	Position or Movement
Surprise-Startle	Eyebrows	May be raised (with open eyes) or lowered slightly.
	Eyes	May be either wide open and rounded or blinking.
	Mouth	Usually open and rounded to form an "O."
	Forehead	Muscles horizontally contracted, creating transverse wrinkles.
	Jaw	Slack; muscles of lower face elongated.
Distress-Anguish	Eyebrows and Forehead	Muscles contracted, pulling eyebrows together. Inner corners may be raised or lowered slightly. Vertical wrinkles appear between inner corners.
	Eyes	Eyelids contracted, eyes being partially closed.
	Mouth	Corners drawn in and turned down. Tense; center of lower pushed upward; furrow from nose to mouth formed.
Disgust-Revulsion	Eyebrows	May be slightly lowered.
	Eyes	May be partially closed, result of nose being drawn upward.
	Mouth	Upper lip raised. Corners drawn down and back; tongue moved forward, may be slightly protruding.

Table 23 (Continued)

Emotion	Feature	Position or Movement
Disgust-Revulsion (Continued)	Nose	Drawn up, wrinkled.
Anger-Rage	Eyebrows	Drawn together and down, causing vertical wrinkles between.
	Eyes	Opened wide, fixated. May become reddened, pupils contracted.
	Mouth	Teeth usually clenched tightly. Rigidity of lips and jaw. Lips may be tightly compressed, or may be drawn back to expose teeth.
	Nose	Nostrils distended.
	Neck	Muscles strained and rigid.
Shame-Humiliation	Forehead	May be wrinkled vertically or transversely.
	Eyebrows	Inner corners may be drawn down.
	Eyes	Lowered, or glancing.
	Mouth	Lips drawn in, corners depressed. Lower lip may either protrude slightly, or be tucked between teeth.
	Head	Lowered.

Table 2.3 (Continued)

Emotion	Feature	Position or Movement
Fear–Terror	Forehead	Wrinkled transversely.
	Eyebrows	Raised.
	Eyes	Widely open, staring. Pupils dialated.
	Mouth	Open, rigid. Corners drawn back and depressed.
	Cheeks	Lower parts drawn down and back, due to action of mouth.
	Nose	Nostrils flared.
Contempt–Scorn	Eyebrows	One may be raised slightly higher than the other.
	Eyes	Somewhat narrowed.
	Mouth	Corners depressed. Lower lip raised, slightly protruding. One side of upper lip may be raised in a sneer.
	Cheeks	Drawn down by movement of mouth.
	Head	May be thrown back.
	Nose	Nostrils may be flared outward.

Source: Izard, Carroll E. "Face of Emotion," 1971.

with a criterion of 70 percent agreement by 10 or more American subjects. A goal to have a different person in each photo further eliminated some photos (Izard, 1971).

The remaining set of photos was supplemented by photos posed by 25-30 Parisian university students. This new group of pictures was again screened by judges for goodness of fit with the remaining photos placed in a given category by 70 percent or more agreement of a group of at least 10 American subjects.

The last set of photos developed were posed by 15 American actors and actresses studying in Paris. This set of photos was screened by judges and then submitted to a group of 10 or more American subjects for 70 percent agreement. The 70 percent agreement criterion was met for all photos except for a distress-anguish photo (50 percent agreement), a disgust photo (60 percent agreement), two shame photos (65 percent agreement) and a fear photo (about 60 percent agreement) (Izard, 1971).

Cross-Cultural Studies with Photographs, Emotion Categories and A Priori Definitions

The Emotion Recognition Test and the Emotion Labeling Test were administered cross-culturally with the assumption that facial expressions are universal for the eight emotion categories. The Emotion Attitude Questionnaire was administered cross-culturally to explore intra and inter-cultural attitudes toward the eight emotion categories. The Emotion

Recognition Test required that subjects match pictures (presented one at a time) with one of the eight emotion categories. The Emotion Labeling task required that subjects view pictures of facial expression and generate their own descriptive labels for the pictures. Izard postulated that cross-cultural responses to the Emotion Labelling Test would result in less agreement than responses to the Emotion Recognition Tests. Izard considered performance on the Labeling Test to be more dependent on cognition and personality than performance on the Recognition Test.

Emotion Recognition Studies

University students from nine literate cultures ranging in age from 18-30 were tested in groups by test administrators of the same nationality and native tongue as the subjects. The average agreement across all nine cultures for placing the 32 photos in the appropriate categories was 78 percent--a chance agreement would have been 12.5 percent. The results for these 592 subjects are presented in Table 2.4.

Emotion Labeling Studies

The Emotion Labeling Test was administered to 268 of the subjects who participated in the Emotion Recognition Test. The subjects were tested in the same sitting and within groups by test administrators of the same nationality and native tongue. "Free response labels" (Izard, 1971) given by the subjects were judged by 13 raters who categorized

Table 2.4

Classification of Facial Expressions of Emotions:

Recognition Scores (%) in Modal Categories*

		Cultural (National) Group							
N=	American 89	English 62	German 158	Swedish 41	French 67	Swiss 36	Greek 50	Japanese (Tokyo) 60	African** 29
Interest-Excitement	84.5	79.2	82.0	83.0	77.5	77.2	66.0	71.2	51.8
Enjoyment-Joy	96.8	96.2	98.2	96.5	94.5	97.0	93.5	93.8	68.0
Surprise-Startle	90.5	81.0	85.5	81.0	84.2	85.5	80.2	79.2	49.0
Distress-Anguish	74.0	74.5	67.2	71.5	70.5	70.0	54.5	66.8	32.2
Disgust-Contempt	83.2	84.5	73.0	88.0	78.5	78.2	87.5	55.8	55.0
Anger-Rage	89.2	81.5	83.2	82.2	91.5	91.8	80.0	56.8	50.8
Shame-Humiliation	73.2	59.5	71.8	76.2	77.2	70.0	71.0	41.2	43.2
Fear-Terror	76.0	67.0	84.0	88.8	83.5	67.5	67.8	58.2	49.0
Average	83.4	77.9	80.6	83.4	82.2	79.6	75.1	65.4	49.9

*The modal category was the emotion category the photo was selected to represent, with selection based on certain general theoretical considerations and the empirical criterion of 70 percent agreement among the American pilot subjects.

**The Africans did not receive the task in their native language and are excluded from most of the analyses.

Source: Izard, Carroll E. "Face of Emotion," 1971.

responses in accordance with the eight emotion categories.
Labels considered appropriate for the eight emotion cate-
gories are reported in Table 2.5. Average agreement for
females across emotions was 56 percent; the average agree-
ment for males was 50 percent. Percentages of responses
judged to be correct are recorded in Table 2.6. Cross-
cultural agreement was considerably less for this task
than for the recognition task. Izard accounts for this
difference by stating that performance on the labeling task
involves more interaction with the cognitive subsystem
of personality (Izard, 1971).

Emotion Attitude Questionnaire Studies

Five hundred thirty-three subjects who participated
in the Emotion Labeling and Recognition experiments
responded to the Attitude Questionnaire as well. Izard
found the most prominent intercultural differences with
the Emotion Attitude Questionnaire. Izard presented
subject responses for only one of the questions used in
the present study: "Which emotion do you most prefer to
experience?" Data for cross-cultural responses to this
question are reported in Table 2.7.

In summary, preliterate studies and cross-cultural
studies with literate cultures have resulted in findings which
are supportive of the universal viewpoint. Studies comparing

Table 2.5

"CORRECT" FREE-RESPONSE LABELS FOR THE SERIES I

PHOTOS OF FUNDAMENTAL EMOTIONS

N=268 - 89 Americans, 62 British, 67 French, 50 Greeks
(A Priori Definitions of Emotion Categories are Centered, Followed by
Correct Transcultural Free-Response Labels in Columns.)

INTEREST-EXCITEMENT

Concentrating, attending, attracted, curious

attentive	fervor**	questioning
concentration	inquisitive	reflection*
concern*	interest	religious fervor**
contemplation*	observation**	seriousness
curiosity	pensive	somber reflection
deliberating	pondering	thoughtfulness
excitement**	puzzlement	wonder
expectation*		

ENJOYMENT-JOY

Glad, merry, delighted, joyful

amusement	gratitude**	playful
bliss*	happiness	pleasantness
clowning	humor*	pleasure
contentment	jovial	rapture
delight*	joy	satisfaction
ecstasy	laugh	sees something
elation	merry	pleasant
enjoyment**	mystical	self-
gaiety	ecstasy	satisfaction*
glee*	optimism	serenity*
		smile

SURPRISE-STARTLE

Sudden reaction to something unexpected, astonished

amazed	pleasant	surprise
amused surprise**	astonishment	surprise, fear
astonishment	pleasant	surprise, joy
fearful	surprise**	surprise with
astonishment	shock	fear
joyful surprise	startle*	

DISTRESS-ANGUISH

Sad, unhappy, feels like crying

about to cry*	grief	sad
anguish	hurt	sorrow
bad news	loneliness	suffering*
crying	melancholy**	troubled*
dejected	misery*	uneasiness
dejection	not going well	unhappy
depression	pain*	unloved*
despair	pathetic	upset*
disappointment	pity**	worry
distress		

DISGUST-CONTEMPT

Sneering, scornful, disdainful, revulsion

aversion**	dislike	scorn
contempt	distaste	skepticism
cynical	insolence**	smirk*
derision	mockery*	smug**
disapproval	repugnance*	sneer
disdain	repulsion	superiority
disgust	sarcasm	

ANGER-RAGE

Angry, hostile, furious, enraged

aggressive	furious	revenge*
anger	fury	spite
bitterness**	mad	vengeful*
enmity*	rage	vexation**
ferocity*		

SHAME-HUMILIATION

Shy, embarrassed, ashamed, guilty

ashamed	guilt	shame
bashful**	penitent	shyness
embarrassment	repentance**	timidity

FEAR-TERROR

Scared, afraid, terrified, panicked

anxious	fright	scared
apprehension	horror	terror
fear	panic*	

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*Words unique to females
**Words unique to males

Source: Izard, Carroll E. "The Face of Emotion," 1971.

Table 2.6

Percentage of Subjects Giving "Correct" Response on Emotion Labeling Task

Percentage Using Label

Emotion	American		English		French		Greek	
	Male (N=50)	Female (N=39)	Male (N=23)	Female (N=39)	Male (N=14)	Female (N=53)	Male (N=25)	Female (N=25)
Interest-Excitement	31.7	43.5	29.9	36.0	25.1	34.1	36.5	35.2
Enjoyment-Joy	90.2	89.3	71.3	84.7	93.9	82.1	80.0	80.4
Surprise-Startle	87.9	89.7	73.1	83.4	60.7	65.8	52.7	60.0
Distress-Anguish	57.6	63.4	54.4	68.9	82.2	53.2	43.9	55.3
Disgust-Contempt	45.4	53.6	44.5	47.5	39.4	48.8	42.1	55.3
Anger-Rage	63.2	70.4	56.0	57.0	37.5	58.0	39.6	54.6
Shame-Humiliation	9.1	14.7	9.5	6.9	7.2	18.2	33.9	18.4
Fear-Terror	62.4	56.1	54.4	61.5	58.9	63.2	74.0	67.7

Table 2.7

Distribution of Responses (Percentages) of Seven Cultural

Samples for Question: Which Emotion Do You Prefer to Experience?

		American		English		German		Swedish		French		Greek		Japanese	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
	N	48	40	22	40	83	73	15	26	14	54	24	25	42	18
Interest- Excitement	%	18	10	36	35	24	16	_47_	23	21	32	38	44	31	39
Enjoyment- Joy		_76_	_90_	_59_	_65_	_70_	_75_	_47_	_73_	_71_	_67_	_46_	_56_	_69_	_61_
Surprise- Startle		0	0	0	0	2	8	7	4	0	2	4	0	0	0

Modal categories are underlined. Broken lines indicate tied categories.

Source: Izard, Carroll E. "Face of Emotion," 1971.

the facial expressions of emotion in blind and sighted children also demonstrate the universal and innate aspects of facial affect.

Studies on Recognition of Facial Expression
by Blind and Sighted Subjects

Fulcher (1942) photographed and compared the facial expressions of 118 sighted subjects ranging in age from 4 to 16 with 50 blind subjects from 6 to 21 years of age. Both groups of subjects were asked to pose happy, sad, angry, and afraid feelings. Fulcher's findings indicate that sighted children exhibit more facial activity while expressing emotions upon request; however, both groups exhibited enough facial activity to portray the four emotions. Fulcher concluded that sight is an important factor in the ability to form appropriate expressions; however, visual imitation is only one way of acquiring that ability. Although Fulcher's instructions and procedures for photographing his subjects may have interfered with his findings, his findings, which indicate that blind children are capable of expressing facial emotion, have been supported by Thompson (1941), Goodenough (1932), Charlesworth (1970), and Eible-Eibesfeldt (1970). Charlesworth (1970) filmed surprise responses in facial expressions of the blind and sighted, noting no significant differences in facial patterns and facial activity between

both. His subjects were sighted and congenitally blind, ranging in age from 6 to 14 years. Thompson (1941) studied children ranging in age from 7 weeks to 13 years of age; 28 were blind and 29 were sighted. Subjects were photographed in natural settings involving the expression of emotion. Judges defined the photographs in terms of a checklist of 10 expressions describing physical characteristics of the face. It was found that expressions of joy, sadness, and anger occur in the blind, but not as uniformly as in the sighted. She speculated that maturational processes were responsible for the demonstration of facial affect in blind children. Age and developmental studies tend to support her findings.

Age and Developmental Studies

Odom and Lemond (1972) presented Izard's 32 photographs of facial expression to two different age groups comprising a total of 64 child subjects--32 boys and girls from the 5-8 years age group and 32 boys and girls from the 7-10 years age group. Izard's eight categories were also employed. For a discrimination task, children were expected to point to one of the 32 pictures upon hearing a test administrator read stories or situations depicting one of the photographs. The second task for subjects involved asking them to imitate faces on the photographs on the basis of hearing situational stories depicting the

eight emotions. The faces posed during the imitation task were filmed. Five raters were trained to rate the imitations according to appropriateness for each of the eight categories. Performance on the discrimination of photographs increased with age, with the exception of identification of the interest-excitement pictures, which was equally difficult for both age groups. Imitation of Izard's photographs did not improve with age as consistently as the discrimination performance did. However, for both tasks, the older children were more accurate with their matching and imitating behaviors.

Izard studied responses to the emotion recognition and labeling tests by French and American children from ages 2 1/2 through 9 years. The recognition and labeling tasks were adapted for use with the verbal skills presented by the subjects. For the recognition task, children were presented with 36 sets of three photographs and asked to select the one which depicts one of the eight categories. For the labeling task, children were asked to describe verbally how the person in each of the 18 photographs was feeling. Agreement among the children on both tasks increased with age.

Honkavaara (1961) investigated the differences among subjects of various ages from 5 to 80. She studied subjects' responses to concrete forms, colors, and photographs depicting happy, miserable, and neutral emotions.

The youngest children subjects tended to respond to concrete aspects of photographs, e.g., clothing; their ability to label facial expression was found to increase with age. Accuracy of identification of photographs for adults was found to decrease for those subjects from 50 to 80 years of age who had limited formal education. Photographs and sketches used by Honkavaara included face only and full body representations. Her sources for the photographs were pictures from periodicals. Honkavaara's research findings were limited because she used various types of stimuli and provided few categories.

Sex Differences in Perceiving
Facial Expressions of Emotion

Westbrook (1974) examined sex differences on several dimensions of the perception of emotion: accuracy of judgment of the emotion, attention paid to emotional cues, and type of error made when incorrectly judging emotions in relationship to emotions being expressed and sex of the expressor. Photographs of several people interacting were selected from magazines and were made into nine slides. One hundred subjects were given one point for every feeling word and any word modifying a feeling word. Hypothesized sex differences for accuracy in judging emotions were not supported. Westbrook's task did not include any categorization of feelings and her photographs did not focus on facial expression.

No differences were found between males and females in terms of perception of emotion portrayed in seven emotions: anger, happiness, surprise, fear, disgust, pain, and sadness, by Black (1969). The photographs were posed by Black and Caucasian actors. The 160 undergraduate student subjects representing both races were tested individually; they were provided with seven slips of paper, each with the name of one emotion and asked to match the slips with the photographs.

Gitter, Black, and Mostofsky (1972) used the same emotion categories and testing procedures as Black (1969) to study race of perceiver, sex of perceiver, sex of expresser, and race of expresser. Their findings included no sex differences for sex of perceiver when subjects were asked to match one of the seven categories with photographs shown.

Buzby (1924) utilized Boring and Tichener's (1923) descriptions of facial expressions and photographs to study the labeling and sex differences of 716 students. The expressions used were anger, dismayed, horrified, disdainful, disgusted, and bewildered. Subjects selected a feeling name provided to label the photographs. Women made a greater number of correct judgments than men, overall.

Allport (1924), Guilford (1929), and Coleman (1949) utilizing the Rudolph pictures found no differences between males and females for the judgment of facial expressions of emotion.

Females representing four different cultures in Izard's cross-cultural study received a higher percentage of correct responses than males. The percentage of correct responses for females was 56 percent, for males, 50 percent. However, most of the literature indicates no sex differences in the labeling and recognition of emotion or slightly better scores for females.

Rosenthal, Archer, DiMatteo, Koivumaki, and Rogers (1974) developed a Profile of Nonverbal Sensitivity (PONS) which measures a person's ability to understand nonverbal cues. The test consists of a 45-minute film which presents the viewer with a series of facial expression scenes, a few spoken audible sounds or scenes of various body postures and movements. Subjects describe scenes by making one of two choices provided on a test form, e.g., two possible answers for a portion of the film are "expressing jealous anger" or "talking about one's divorce." Females from 81 of 98 sample groups with both sexes included received higher scores on 11 aspects of nonverbal communication, including facial expression.

"A Study of the Specificity of Meaning in Facial Expression" by Dusenbury and Knower (1938) resulted in females responding to photographs and films depicting a male and female facial expression more accurately than males. Eleven emotion categories, each including three synonyms, were provided for subjects to match the facial expressions

of the expressions in the films. In 4,004 judgments made by males and 4,532 judgments made by females, the differences in judgment between the sexes was estimated at a critical ration of 10.00 in favor of the females.

Kozel (1969) studied race of expressor, sex of perceiver, and mode of presentation by using 70 still photographs posed by five Caucasian and five Black actresses depicting seven emotions: anger, happiness, surprise, fear, disgust, pain, and sadness. Subjects judged the photographs by using a list of the seven emotions provided. Of the seven emotions, women were superior to men in accuracy of judgments for the happiness, fear, disgust, and sadness photographs.

<u>Personality Characteristics Related to</u>

<u>the Perception of Facial Expression</u>

A number of researchers have attempted to correlate personality variables with the labeling and posing of photographs of facial expression. An "Emotional Projection Test" by Glad and Shearn (1956) was developed as a diagnostic tool for the study of affect responses of psychotherapy patients. The test contains 30 pictures of facial expression, e.g., surprise, distress, disgust, which are assumed to reflect personality characteristics of the respondents. A comparison of major groupings of responses given by non-clinical and clinical subjects indicated that

psychotics, neurotics, and adult normals differ in response to photographs depicting a variety of negative and positive emotions. The test has been used to assess client progress during psychotherapy.

Schiffenbauer (1974) found that subjects viewing slides of facial expression were influenced by their own emotional state. Schiffenbauer induced various states of arousal by presenting different noises to the raters during the presentation of the slides.

"The Emotion Projection Test" and Schiffenbauer's testing conditions suggest that the immediate emotional state of the perceiver can influence the labels used.

Dougherty, Bartlett, and Izard (1969) found that normals were significantly more accurate than schizo-phrenics in identifying facial expression of emotion. Shannon (1971) discovered differences in the recognition of specific emotional states but no overall differences between normals and depressives and schizophrenics.

Tomkins and McCarter (1964) showed photographs of eight affects to subjects assuming that a subject's pattern of errors in identification reflected his "Affect Sensi-tivity Contour." Conclusions drawn regarding a relation-ship between subject responses and identification errors are not definite.

Izard's Emotion Attitude Questionnaire had been developed for the purpose of investigating attitudes toward

the eight emotions used in the Labeling and Recognition
Tests. Further research with attitude inventories and
other means of assessing how perceivers of facial expression
make their judgments will provide useful information
regarding the communication of emotion in clinical and
non-clinical settings.

Chapter III

DESIGN AND METHODOLOGY

The purpose of this study was twofold: to compare
the emotion recognition and labeling behaviors of three age
groups, 18-35, 35-60, and 60+ and genders within the age
groups, to photographs of facial affect; and to compare
the attitudes of these age groups to the eight emotion
categories depicted in these photographs. In order to
test the hypotheses related to this purpose, the following
design and procedures were formulated.

Hypotheses

Ho_1: No differences will be found between age group mean
scores on the Emotion Labeling Test.

Ho_2: The mean score for females within age group 18-35
will not exceed the mean score for males within age
group 18-35 on the Emotion Labeling Test.

Ho_3: The mean score for females within age group 35-60
will not exceed the mean score for males within age
group 35-60 on the Emotion Labeling Test.

Ho_4: The mean score for females within age group 60+
will not exceed the mean score for males within age
group 60+ on the Emotion Labeling Test.

Ho$_5$: No differences will be found between age group mean
scores for the Emotion Recognition Test.

Ho$_6$: The mean score for females within age group 18-35 will
not exceed the mean score for males within age
group 18-35 on the Emotion Recognition Test.

Ho$_7$: The mean score for females within age group 35-60 will
not exceed the mean score for males within age
group 35-60 on the Emotion Recognition Test.

Ho$_8$: The mean score for females within age group 60+
will not exceed the mean score for males within
age group 60+ on the Emotion Recognition Test.

Ho$_9$: No differences will be found between age group
distributions of responses for any of the 10 questions
on the Emotion Attitude Questionnaire.

Ho$_{10}$: No differences will be found between age group
distributions for agreement between "emotion ex-
perienced most frequently" reported on the Emotion
Attitude Questionnaire and emotion category with the
highest score on the Emotion Recognition Test.

Ho$_{11}$: No differences will be found between age group
distributions for agreement between "emotion ex-
perienced least frequently" reported on the Emotion
Attitude Questionnaire and emotion category with the
lowest score on the Emotion Recognition Test.

All hypotheses were tested at the .05 level of significance.

Selection and Description of the Sample

Subjects who participated in this study consisted of
60 individuals representing three age groups: 18-35, 35-
60 and 60+. The 18-35 group consisted of 10 graduate
and 10 undergraduate students enrolled at Michigan State
University during Winter and Spring terms, 1976. The
graduate students resided in the graduate dormitory on
campus. The undergraduate students resided in one of the
undergraduate dormitories on campus. The Director of
Residence Halls approved the selection and testing of resi-
dents from those dormitories, as well as the use of rooms
within both dormitories for the testing of subjects.

A list of residents from the graduate dormitory was
compiled; foreign students were excluded from this list.
Each of the remaining 741 residents was assigned a number
from 1 to 741. A list of residents from the undergraduate
dormitory was provided. Each of the 1,287 residents was
assigned a number from 1 to 1,287. A table of random
numbers was used to select 50 residents, 25 males and 25
females, from each of the two dormitories.

Memos were sent to these 100 students to explain how
and why they were selected; the memos also indicated that
they would be contacted in person regarding their interest
in participating in this study. Students were contacted
in order of their random selection until five males and
five females from each dormitory agreed to participate.

Seventy-two graduate and undergraduate students were con-
tacted. Twenty-eight percent of those contacted agreed to
participate. Students who refused to participate gave
reasons of scheduling conflicts and lack of time.

The 20 subjects in the 35-60 group were randomly
selected from a list of Michigan State Faculty and Staff
ranging in age from 35-60. This list was provided by the
Office for Institutional Research, Michigan State University
Office of the Provost. Each person on this list of 2,254
was assigned a number from 1 to 2,254. A table of random
numbers was used to select 63 males and 63 females. These
126 faculty and staff members were sent letters explaining
how and why they were selected. The letters also indicated
that they would be contacted in person regarding their
interest in participating in this study. They were con-
tacted in order of random selection until 10 males and 10
females agreed to participate. One hundred and three
faculty and staff members were contacted. Nineteen per-
cent of those contacted agreed to participate in this study.
Those who refused to participate reported the following
reasons: lack of time, scheduling conflicts, and disinterest
in the topic or field of psychology.

Subjects from the 60+ group resided at a local
Retirement Center. Residents of this Retirement Center
were 65 years of age or older; most were retired Michigan
State University faculty and staff or retired professionals.
They had invested in life-leases ranging from $10,000-$30,000.

All intended to spend the rest of their lives there. A
meeting was arranged with the Director of thie Retirement
Center to explain the purposes and procedures of the
study. Permission was obtained to select residents for
participation and to test residents on the premises. A
list of residents was provided. Residents who were either
vacationing in Florida or confined to the health care unit
of the retirement center were excluded from the selection
process. Each of the remaining 85 residents was assigned
a number from 1 to 85. A table of random numbers was
used to select 20 males and 30 females. Individuals on
this list were contacted in order of random selection. The
majority of residents contacted initially refused to par-
ticipate for reasons of ill health. Since residents con-
tacted initially refused to participate for reasons of
ill health and the mortality rate for this age group was
assumed to be high, a decision was made to contact all 50
people on the list. Twenty-nine (58 percent of those con-
tacted) agreed to participate, 18 females and 11 males.

The Wechsler Adult Intelligence Scale (WAIS) vocabulary
subtest was administered to these 29 individuals to screen
out those who were below average in organizing associations
into verbal meanings. All 29 scored average, above-average
and superior. The WAIS vocabulary subtests were administered
by graduate students at Michigan State University who were
enrolled in "Individual Measures I" Winter Term, 1976.
Shortly after all the vocabulary tests were administered,

one male subject died and another was admitted to the health
care unit at the Retirement Center, leaving nine males.
One more male subject was needed. Therefore, a random
number was assigned to each of the 35 residents (no dupli-
cates) who were included within the original list of 85
residents, but who were not included within the original
list of the 50 randomly selected residents. The 35 ran-
domly numbered residents were rank ordered from highest
to lowest number, and the first male whose name appeared
was contacted. He agreed to participate and scored above-
average on the WAIS vocabulary subtest. He became the
tenth male subject. These 10 males and the first 10 females
out of the 18 who agreed to participate represented the
over 60 group. Those who refused to participate reported
reasons of ill health or the ill health of a spouse. Demo-
graphic data further describing the three age groups is
presented in Table 3.1.

Procedures for Testing

Thirteen graduate students enrolled in Counseling
Psychology at Michigan State University and professionals
working within the field of counseling volunteered to be

Table 3.1

Demographic Data for 60 Subjects

Age Group	Sex		Marital Status				Employment Status			Gross Yearly Family Income Level						Education					Age	
	Male	Female	Single	Married	Widowed	Divorced	Working Full-time	Working Part-time	Not working	Under $3,000	$3,000-4,999	$5,000-6,999	$7,000-9,999	$10,000-14,999	$15,000 and over	Some High School	High School Completed	Some College	4 Years College	More than 4 Years College	Mean	Median
18-35	10	10	20				1	5	14	2	1	1	1	3	12			9		11	22.2	22.0
35-60	10	10	2	14	3	1	18	2							20				2	18	46.9	45.5
60+	10	10	3	7	7	3		3	17	2	1	5	3	6	3	2	1	2	4	11	74.9	80.5

test administrators for this study. Test administrators participated in a two-hour group training program prior to administering the tests. During the training program, test administrators became familiar with the test materials and participated in a simulation of the test procedures. Test administrators were unaware of the research hypotheses for this study. Assignment of test administrators to subjects was based on corresponding time schedules.

Test administrators and subjects met for the first time at the scheduled testing times. Each of the 60 subjects was tested on an individual basis by one test administrator. The following test materials were used with each subject:

1. Slide projector

2. Projector screen

3. 36 numbered slides of facial affect

4. Stopwatch

5. Pencils

6. Test packet containing subject consent form, demographic data form, and one copy of each of the three tests (See Appendix A for copy of test packet)

The slide projector and the projector screen were set up by the test administrator prior to scheduled test times.

The Emotion Labeling Test, the Emotion Recognition Test, and the Emotion Attitude Questionnaire were administered

during the same 1 1/2 hour sitting. Subjects completed a
subject consent form and a demographic data form before
reading the instructions for the first test. The Emotion
Labeling Test was administered first. Subjects were given
60 seconds to view each of the 36 slides and write down
what they thought the person in each slide was feeling.
When 60 seconds elapsed, the next slide was shown.

The Emotion Recognition Test was administered imme-
diately after subjects completed the Emotion Labeling Test.
During the Emotion Recognition Test, subjects viewed the
same 36 slides and in the same order as for the Emotion
Labeling Test. Subjects were instructed to write the
number of each slide under one of the eight feeling cate-
gories and their a priori definitions. Subjects viewed
the slides and responded at their own pace--taking 10-30
seconds to view and respond to each slide. The first four
slides shown during the Emotion Labeling and Recognition
Tests were used to familiarize subjects with the test
procedures and were not scored for the analysis of the data.
The first four slides were labeled contempt-scorn by
Izard (1971).

The Emotion Attitude Questionnaire was the last test
administered. This test consisted of 10 questions regarding
attitudes toward the eight emotion categories and their
a priori definitions. Most subjects completed this
questionnaire within 10 minutes.

Procedures for Rating Subject Responses

to the Labeling Test

Five raters agreed to score the 60 subjects' responses
to the Emotion Labeling Test. Three of the raters were
males; two were females. Two raters were between ages
18-35, two were between ages 35-60, and one rater was
over 60 years of age. Two of the raters held Ph.D. degrees
in Counseling. One rater had a Master's Degree in Counseling,
and one rater had a Master's Degree in Social Work. The 60+
rater was a retired Licensed Practical Nurse who had prior
training in empathy and listening skills.

The five raters participated in an eight-hour training
program. The training program included a brief intro-
duction to the purposes and procedures for this study,
familiarization with the eight categories of emotion and
their synonyms, and experience in using the scoring
criteria with several mock-up emotion labeling tests.

Prior to the scoring of subject responses, it was
decided that four out of five raters must agree on scores
for each item before assigning a correct or incorrect score
to that item. A criterion of four out of five rater agree-
ment was chosen to increase the chances of eliminating
scoring errors. Those items agreed on by only three out
of five raters were scored incorrect. Plans were made to
add five more raters and use a seven out of ten criterion
if overall agreement between the first five raters (for
the 1,920 items) resulted in less than 80 percent.

Raters scored subject responses independently of each other. Scoring materials used by raters included a master list for correct responses which corresponded with test item numbers, and a detailed description of the scoring criteria. The master list of correct responses for each category consisted of the emotion labels derived from Izard's cross-cultural research and the a priori definitions (Izard, 1971). Scoring criteria were classified according to two dimensions, i.e., correct and incorrect. Each of these two dimensions was divided into "clear cut" and "use your own judgment." One of four possible scores was assigned to an item by a rater: (1) correct, "clear cut," (2) correct, "use your own judgment," (3) incorrect, "clear cut," (4) incorrect, "use your own judgment." Descriptions of the scoring criteria and the master list used by raters are presented in Appendix B.

At least four out of five raters agreed on 1,794 of the 1,920 items, yielding 93 percent overall agreement by the raters for 1,920 items. Items 8, 19, and 35 accounted for the greatest proportion of items on which only three out of five raters agreed. Items 8 and 35 were interest-excitement photographs and item 19 was a shame-humiliation photograph.

Assessment of the Instrument

Reliability Analysis

A Homogeneity Reliability was performed for the four items/photographs within each of the eight emotion categories for the Emotion Labeling and the Emotion Recognition Tests. A coefficient of reliability computed by Hoyt's (1941) analysis of variance method gives the percentage of obtained variance in the distribution of scores for the four items within a category that may be regarded as true variance or variance not due to the unreliability of the four items. Homogeneity reliability coefficients are considered coefficients of equivalence which indicate how nearly the four ietms for each category agree or measure the same thing.

A homogeneity coefficient of less than zero was considered indeterminate; a coefficient of 0-.40 was considered extremely poor; .40-.60 was considered poor; .60-.80 was considered fair-good; and .80-1.00 was considered good-excellent. In other words, high homogeneity coefficients reflect a greater degree of similarity among four items within a category. Items within a category estimated to have a homogeneity coefficient of .40 or less were considered to be lacking in homogeneity. Items within six categories for the Labeling Test received homogeneity coefficients greater than .40; the two categories with coefficients less than .40 were distress-anguish

(indeterminate) and shame-humiliation (.07). Items within
six categories for the Recognition Test yielded coefficients
greater than .40; the two categories with coefficients less
than .40 were enjoyment-joy (.30) and distress-anguish (.37).
Items within the shame-humiliation category for the Emotion
Recognition Test received the highest homogeneity coef-
ficient (.65) and were considered to have a greater degree
of homogeneity than items for the other categories on both
tests. The shame-humiliation items for the Recognition
Test were more likely measuring the same construct.

Although the homogeneity coefficients for categories
within the Recognition Test were higher than homogeneity
coefficients for the Labeling Test, coefficients for both
tests indicated that the four items within each category
on both tests were generally not measuring unidimensional
constructs. The Hoyt Homogeneity Reliability Coefficients
for both tests are reported in Table 3.2.

Since the homogeneity reliability coefficients were
remarkably low, a comparison was made between reliability
coefficients and the cell means and standard deviations
(Appendix D) for categories within both tests. Examination
of the three different calculations for specific categories
led to the finding that cell means for the enjoyment-joy
category were high while the variances were low, indi-
cating that subjects were responding in the same way to
those items; however, homogeneity coefficients for this

Table 3.2

Hoyt Reliability Coefficients for the Emotion Labeling
and the Emotion Recognition Tests

Category	Labeling Test	Recognition Test
Interest-Excitement	.46	.61
Enjoyment-Joy	.55	.30
Surprise-Startle	.49	.52
Distress-Anguish	**	.37
Disgust-Contempt	.50	.51
Anger-Rage	.50	.57
Shame-Humiliation	.07	.65*
Fear-Terror	.48	.46

* Highest homogeneity coefficient computed
** Indeterminate
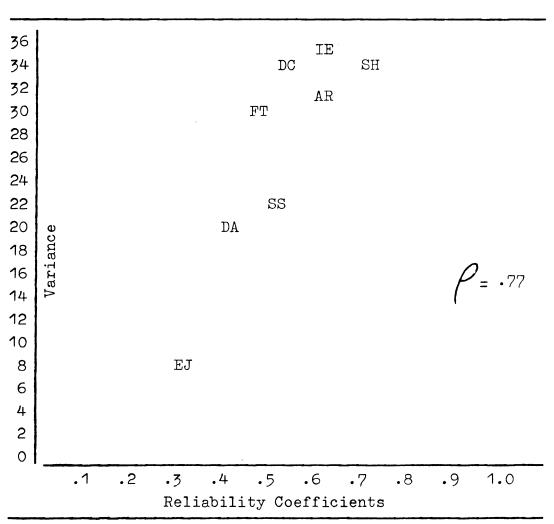
category were low. It appeared that there was a discrepancy between the three sets of results, i.e., although most of the subjects were responding correctly to the enjoyment-joy category on both tests, the homogeneity coefficients for this category indicated that items for this category were not measuring the same construct. A Spearman Rank Correlation Coefficient was performed for the homogeneity coefficients and the ranked variances for the Recognition Test. The rank order correlation between the two was estimated at .77. It was determined that the

distribution of the reliability coefficients was reflective

of distribution of variances among subjects within each

category. The relationship between ranked variance and

homogeneity coefficients is reported in Table 3.3.

Table 3.3

Spearman Rank Order Correlation for Reliability Coefficients
and Ranked Variances for Categories
within Recognition Test

IE = Interest-Excitement   DC = Disgust-Contempt
EJ = Enjoyment-Joy   AR = Anger-Rage
SS = Surprise-Startle   SH = Shame-Humiliation
DA = Distress-Anguish·   FT = Fear-Terror

Given the high correlation (.77) between the homo-
geneity reliability coefficients and the ranked variances,
the validity of the Hoyt Reliability Coefficients as
indicators of the homogeneity of items within a given
category was questionable. An alternative indicator of
reliability for items within categories was explored.
Percentage of agreement for subject responses to specific
items within categories and to each of the eight categories
was examined for both tests.

Within a category, the percentage of correct responses
for an item and the percentage of subjects receiving
correct responses for an item are the same. There were
60 subjects and 60 possible correct responses. For the
Labeling Test, items 23 and 28 within the shame-humiliation
category received the lowest percentage of correct responses,
i.e., 5 percent; and item 22 within the enjoyment-joy
category received the highest percentage of correct respon-
ses, ·i.e., 96 percent. For the Recognition Test, item 15
within the fear-terror category and item 17 within the
disgust-contempt category received the lowest percentages
of correct responses, i.e., 41 percent. On the same test,
item 10 within the enjoyment-joy category received the
highest percentage of correct responses, i.e., 98 percent.
Items within the enjoyment-joy category received the
highest percentage of correct responses for both tests,
while items within the shame-humiliation (Labeling Test)

fear--terror and disgust--contempt (Recognition Test) cate-
gories yielded the lowest percentages of correct responses.
Table 3.4 serves as an illustration of percentage of correct
responses/percentage of subjects receiving correct responses
for individual items within each of the eight categories
for both tests.

Percentages of correct responses for all four items
(i.e., out of 240 total responses) within each category for
both tests were calculated and rated from highest to lowest.
Percentage of correct responses for each category on both
tests is reported in Table 3.5. Categories within the
Labeling and Recognition Tests ranked the same from highest
to lowest percentage of correct responses: enjoyment-joy,
surprise-startle, anger-rage, interest-excitement, distress-
anguish, fear-terror, disgust-contempt, and shame-humiliation.
It appeared that subjects responded similarly to categories
on both tests, with enjoyment-joy receiving the highest
percentage of correct responses and shame-humiliation re-
ceiving the lowest percentage of correct responses.

The Spearman Rank Order Correlation between the labeling
data from this study (Table 3.5) and the labeling data
for Americans (Table 3.6) who participated in Izard's cross-
cultural studies was estimated to be .82. The Spearman
Rank Order Correlation between the recognition data from this
study and the recognition data for Americans who participated
in Izard's cross-cultural research was estimated to be .95.

Table 3.4

Percentage of Correct Responses for Items Within Categories for

Labeling and Recognition Tests for Sixty Subjects

CATEGORY	IE				EJ				SS				DA				DC				AR				SH				FT			
ITEM NO.	8	9	31	35	6	10	22	34	13	30	33	36	5	7	26	29	14	17	20	32	11	18	21	27	16	19	23	28	12	15	24	25

Percentage LABELING:

	IE				EJ				SS				DA				DC				AR				SH				FT			
	60	40	55	55	55	80	96	98	81	83	61	61	35	35	65	61	47	23	46	30	78	70	37	85	18	45	5	5	67	28	47	36

Percentage RECOGNITION:

	IE				EJ				SS				DA				DC				AR				SH				FT			
	65	63	88	71	95	98	93	90	85	90	65	73	46	58	76	65	61	41	75	53	78	81	53	85	63	73	48	36	86	41	58	60

Legend:
IE Interest-Excitement
EJ Enjoyment-Joy
SS Surprise-Startle
DA Distress-Anguish

DC Disgust-Contempt
AR Anger-Rage
SH Shame-Humiliation
FT Fear-Terror

Table 3.5

Percentage of Correct Responses for Categories
within the Labeling and Recognition Tests

Categories	Percentage of Correct Responses	
	Labeling	Recognition
Interest-Excitement	52.50	71.75
Enjoyment-Joy	87.25	94.00
Surprise-Startle	71.50	76.25
Distress-Anguish	49.00	61.25
Disgust-Contempt	36.50	57.50
Anger-Rage	67.50	74.28
Shame-Humiliation	18.25	55.00
Fear-Terror	44.50	61.25

In addition to examining subject responses to cate-
gories and items within categories for both tests, patterns
of responses to items for each category were explored to
determine specific items which consistently received
correct and incorrect responses. Table 3.6 illustrates
the possible patterns for correct and incorrect responses
to items within each of the eight categories. Table 3.6
is divided according to type of test and age group.
There were four major possible combinations of correct and
incorrect responses for each category: all four items
correct (4/4), three out of four items correct (3/4),

two items correct (2/4), one item correct (1/4), and zero
items correct (0/4). There were sixteen possible com-
binations of correct and incorrect item responses. Correct
items are designated by a "1" and incorrect items are
designated by "0". For example, 16.67 percent of the 60
subjects received correct scores for all four items for
the interest-excitement category on the Labeling Test,
while 11.67 percent of the 60 subjects received correct
scores for items 8, 9, and 31 and incorrect scores for
item 35 (1110) within the interest-excitement category
for the Labeling Test.

Information gathered from examining patterns of
responses (Table 3.6) was in agreement with percentage of
correct responses for items within categories (Table 3.4).
For.example, there was a low percentage of correct respon-
ses for items 33 and 36 within the surprise-startle
category along with a higher percentage of correct responses
for items 13 and 30 in that same category for both tests.
This variability in responses to items within the surprise-
startle category, as well as variability in percentage of
correct responses to the shame-humiliation, fear-terror,
disgust-contempt, anger-rage, and distress-anguish cate-
gories (both tests), indicated that the items within these
categories were probably not measuring the same constructs.
Items within the interest--excitement and enjoyment-joy
categories (both tests) had less variability in percentage

Table 3.6

Percentage of 60 Subjects Responding with 16 Possible Patterns

of Correct and Incorrect Responses

Item Nos.

IE	8	9	31	35
EJ	6	10	22	34
SS	13	30	33	36
DA	5	7	26	29
DC	14	17	20	32
AR	11	18	21	27
SH	16	19	23	28
FT	12	15	24	25

Pattern (IE EJ SS FT)				Correct	LABELING TEST — Percentages								RECOGNITION TEST — Percentages							
					IE	EJ	SS	DA	DC	AR	SH	FT	IE	EJ	SS	DA	DC	AR	SH	FT
1	1	1	1	4/4	16.67	68.33	31.33	5	5	21.67	0	8.33	45	80	45	20	20	40	23.33	21.67
1	1	1	0	3/4	11.67	1.67	18.33	3.33	5	0	1.33	8.33	5	8.33	8.33	8.33	3.33	10	10	11.67
1	1	0	1		3.33	1.67	18.33	0	3.33	31.67	0	1.33	15	5	20	0	5	15	6.67	5
1	0	1	1		11.67	10	1.67	6.67	5	5	0	11.67	3.23	0	0	10	11.67	3.33	1.67	11.67
0	1	1	1		0	5	5	13.33	5	8.33	1.33	1.33	3.23	1.67	1.67	16.67	6.67	5	5	0
1	1	0	0	2/4	0	0	8.33	3.33	3.33	5	10	0	0	1.67	6.67	0	1.67	1.67	10	3.33
1	0	1	0		3.33	3.33	0	5	10	0	0	6.67	0	0	0	3.33	15	1.67	3.33	8.33
1	0	0	1		10	0	0	5	3.33	10	0	10	0	0	1.67	1.67	1.67	5	3.33	16.67
0	1	1	0		3.33	1.67	0	3.33	3.33	0	3.33	3.33	6.67	0	1.67	3.33	3.33	1.67	3.33	0
0	1	0	1		3.33	3.33	0	1.67	0	3.33	0	3.33	8.33	1.67	3.33	10	3.33	0	0	1.67
0	0	1	1		3.33	1.67	1.67	20	1.67	0	0	1.33	1.67	0	0	1.67	0	6.67	0	3.33
0	0	0	1	1/4	8.33	1.67	1.67	10	6.67	3.33	1.33	0	1.67	0	0	1.67	0	6.67	0	3.33
0	0	1	0		5	3.33	3.33	8.33	10	0	6.67	3.33	5	0	1.67	5	11.67	0	1.67	1.67
0	1	0	0		1.67	0	1.67	5	1.67	1.33	25	3.33	6.67	0	3.33	5	3.33	5	10	1.67
1	0	0	0		3.33	0	1.67	6.67	15	5	5	21.67	1.67	0	5	5	3.33	1.67	5	6.67
0	0	0	0	0/4	15	0	5	3.33	23.33	6.67	43.33	15	3.33	0	0	5	8.33	1.67	13.33	6.67

.

of correct responses. Those items were more likely measuring the same constructs.

Inter-category correlations were performed for the total scores for the eight categories within the Emotion Labeling Test and the eight categories within the Emotion Recognition Test. Inter-category correlations were performed to assess the relationship between each of the eight categories with the other seven categories for both tests. High correlations indicate overlap between categories within a test, while low correlations indicate that a category is discrete and less like other categories. The correlations indicated that categories for both tests tended to be discrete from each other. Inter-category correlations are recorded in Table 3.7.

Inter-item correlations for the Labeling and Recognition Tests were conducted to determine the extent to which both tests were measuring the same underlying constructs. Each item in the Labeling Test was correlated with the corresponding item in the Recognition Test. In other words, item 5 in the Labeling Test was correlated with item 5 of the Recognition Test. The low correlations reported in Table 3.8 indicate that both tests tend to measure different constructs.

In summary, the Hoyt Homogeneity Reliability Coefficients were considered questionable assessments of the reliability of items within categories for both tests;

Table 3.7

Inter-Category Correlations Within the Emotion Labeling

and Within the Emotion Recognition Tests

Emotion	I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
I-E	1.000	.330	.120	.494	.211	.318	.111	.190
E-J	.049	1.000	.447	.382	.219	.480	.214	.126
S-S	.140	.404	1.000	.126	.130	.382	.357	.238
D-A	-.008	.085	.356	1.000	.369	.466	.291	.223
D-C	.272	.083	-.086	-.076	1.000	.376	.307	.255
A-R	-.023	.182	.223	.254	.018	1.000	.400	.126
S-H	-.212	.056	.009	.007	-.153	-.165	1.000	.176
F-T	.076	.108	.006	.039	.190	.144	.064	1.000

Legend: I-E Interest-Excietment   D-C Disgust-Contempt   Upper triangle
         E-J Enjoyment-Joy   A-R Anger-Rage   Recognition
         S-S Surprise-Startle   S-H Shame-Humiliation   Lower triangle
         D-A Distress-Anguish   F-T Fear-Terror   Labeling

Table 3.8

Inter-Item Correlations Between Emotion Labeling and Emotion Recognition Tests

for Corresponding Items/Photographs

	I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
I_1	-.026	.118	.404	.504	.257	.411	.182	.555
I_2	.339	-.065	.116	.337	.253	.066	.205	.369
I_3	.193	-.326	.356	.256	.309	.226	.237	.181
I_4	.366	.398	-.088	.356	.394	.216	.143	.198
Total	.281	.298	.247	.384	.301	.316	.475	.068

I_1 – Inter-item correlation for the first item/photograph within one category for both tests.
I_2 – Inter-item correlation for the second item/photograph within one category for both tests.
I_3 – Inter-item correlation for the third item/photograph within one category for both tests.
I_4 – Inter-item correlation for the fourth item/photograph within one category for both tests.

discrepancies between high mean scores and low coefficients
for the enjoyment-joy category were discovered for the
Recognition Test. A Spearman Rank Order Correlation
yielded a .77 correlation between ranked category variances
and reliability coefficients. Therefore, percentage of
correct responses for categories and items within cate-
gories was chosen as an indicator of reliability.

Categories for both tests were ranked from highest to
lowest percentage of correct responses: enjoyment-joy,
surprise-startle, anger-rage, interest-excitement, distress-
anguish, fear-terror, disgust-contempt, and shame-
humiliation. The same items within categories for both
tests which resulted in highest percentage of correct
responses were surprise-startle, item 30; distress-anguish,
item 26; anger-rage, item 27; shame-humiliation, item 19;
and fear-terror, item 12. Items receiving lowest per-
centage of correct responses for both categories were
surprise-startle, item 33; distress-anguish, item 5; anger-
rage, item 21; shame-humiliation, item 28. There was less
variation in percentage of correct responses for items
within the interest-excitement and enjoyment-joy categories
(both tests) in comparison with the other six categories.

The relationships between categories for both tests
were determined by performing inter-category correlations.
The results indicated that categories for both tests were
distinct, with minimal overlap. Inter-item correlations

comparing the same item on both tests resulted in low correlations, indicating that items for both tests measured different constructs. In general, there was a higher number of correct responses for items and categories on the Recognition Test.

In conclusion, the assessment of the instrument reported thus far indicated that the Labeling and Recognition Tests were measuring different constructs and both tests consisted of discrete categories, while items within the interest-excitement and enjoyment-joy categories appeared to be measuring unidimensional constructs to a greater degree than items within other categories for both tests.

In order to assess the instrument further, factor analyses were performed to determine whether the correlations between the 32 items with each other would result in a reduction or rearrangement of the 32 items to a smaller set of factors or components.

Factor Analysis

A factor analysis was performed to explore and detect the patterning of relationships among items within each of the two tests, Labeling and Recognition. A two-part process was employed to determine if the factor structure reflected the eight a priori categories: a principal components factor analysis with no assumptions about expected structure was performed, followed by a varimax rotation setting the number of factors to eight. Factors were then cast into a

contingency table to indicate degree of match between empirically determined factors and a priori categories. This process was done twice.

In the first attempt, the number of factors rotated to varimax criterion was determined by the eigen value threshold set at 1.00. Twelve factors emerged for the Recognition Test, and fourteen factors emerged for the Labeling Test. The factor loadings for factors and items, setting a minimum value for factor loadings at absolute value of .40, are reported in Table 3.9 for the Recognition Test and in Table 3.10 for the Labeling Test. Items are coded by abbreviations for their emotion categories. Items within factors which are asterisked are items which correlated to a greater degree with that factor than with any other factor. The 12 factors for the Recognition Test and the 14 factors for the Labeling Test were recorded on separate contingency tables to indicate degree of match between empirically determined factors and a priori categories. The contingency table for the 12 Recognition factors is Table 3.11, and the contingency table for the 14 Labeling factors is Table 3.12.

The varimax rotation yielding 12 Recognition factors resulted in the following items with a frequency of at least three items per category: fear-terror, items 12, 15 and 24, as factor two components; interest-excitement, items 8, 31 and 35, as factor three components; all four shame-humiliation items, factor five components; and

Table 3.9

Varimax Rotated Factor Matrix Yielding 12 Factors
with a Minimum Eigen Value at 1.00 for the
Emotion Recognition Measure

Loading	1	2	3	4	5	6	7	8	9	10	11	12
+1.00												
.90	E-J6*		I-E35*									
.80	E-J10*	F-T24*	I-E31*	S-S30*	S-H28*	D-C32I	I-E9*	F-T25*		E-J22*	D-C20*	D-A26*
.70		F-T15*	I-E8*	A-R27*	S-H23*				S-S36*			
.60		F-T12*		D-A7*	S-H16*					A-R11*	A-R18*	
.50	S-S33			A-R11	S-H19*	D-C14*	D-A29*					
	A-R18			F-T12				E-J34*				
.40			E-J34		A-R21*	D-C17	A-R21	D-A5	D-A29	S-H16	A-R21	
			D-A5		D-A5		F-T12					
			D-A7		S-S13		D-C14					
					D-C17		I-E8					
.30		S-H19										E-J10*
		S-S13										
0												
−.30												
.40						D-A5						
.50							S-S33*		T-A7	S-H16		
									D-C17*			
.60												S-S13*
.70												
.80												
.90												
−1.00												

Table 3.10

Varimax Rotated Factor Matrix Yielding 14 Factors

with a Minimum Eigen Value at 1.00 for the

Emotion Labeling Test

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
+1.00														
.90												I-E35*		D-A7*
.80	S-S30* S-S13* E-J22*	F-T12*			E-J34* E-J6*		F-T15*		S-S33*				D-C20* D-C17*	
.70			A-R27* A-R18*	A-R11* S-H19*		D-C14*	D-A5* F-T29*	D A29*		I-E31*	I-E8*			
.60														
.50		F-T24 D-A26	A-R21*	S-S36*	E-J10* E-J10					I-E9*	F-T25* D-C32		D-C32*	
.40		D-A26 S-H23 D-C32 S-H28				S-H28		A-R21	D-A26*	S-S36			F-T25	
♦ :30									D-A29 S-S36	D-A26	D-C17 D-A5 A-R21	D-A26 F-T24		I-E9
0														
- .30		D-C20	S-H19										A-R11	
.40			S-H28*					D-A5	S-H28			D-A26		
.50														
.60														
.70						S-H16*		S-H23*						
.80														
.90														
-1.00														

Table 3.11

Contingency Table for 12 Recognition Factors

Determined at Eigen Value 1.00 and

Eight A Priori Emotion Categories

	1	2	3	4	5	6	7	8	9	10	11	12
I-E			3				1					
E-J	2							1		1		
S-S				1			1		1			1
D-A				1	1		1					1
D-C						2			1		1	
A-R				1						2	1	
S-H					4							
F-T		3						1				

Table 3.12

Contingency Table for 14 Labeling Factors
Determined at Eigen Value 1.00 and
Eight A Priori Emotion Categories

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-E										2	1	1		
E-J	1			3										
S-S	2			1				1						
D-A							1	1	1				1	
D-C						1							3	
A-R			3	1										
S-H			1	1		1		1						
F-T		1					2				1			

disgust-contempt, items 14, 17 and 32, as factor six components. The varimax rotation yielding 14 Labeling factors yielded: anger-rage, items 18, 21 and 27, on factor three; all four enjoyment-joy items on factor five; and disgust-contempt, items 17, 20 and 32, for factor 13.

A second factor analysis was performed by presetting the number of factors at 8 for both tests. The correlations between items and factors, setting a minimum value for the factor loadings at absolute value .40, are presented in Table 3.13 for the Recognition Test and in Table 3.14 for the Labeling Test. Items are coded by abbreviations for their emotion categories. Items within factors which are asterisked are items which correlated to a greater degree with that factor than with any other factor. Contingency tables for the eight categories and eight factors are presented in Table 3.15 for the Recognition Test and in Table 3.16 for the Labeling Test. The correlation coefficients between each item and each factor for both tests are presented in Appendix E.

The varimax rotation with number of factors set at eight for the Recognition Test yielded the following factor with a frequency of three components: fear-terror, items 12, 15 and 24, for factor two; interest-excitement, items 8, 31 and 35, for factor three, all four shame-humiliation items for factor five; and surprise-startle, items 13, 33 and 36,

Table 3.13

Varimax Rotated Factor Matrix

Setting the Number of Factors to Eight

for the Emotion Recognition Test

	F1	F2	F3	F4	F5	F6	F7	F8
+ 1.00								
.90								
.80	EJ10*		IE35*					
			IE31*	AR27*		AR18*		FT25*
.70			IE8*	SS30*	SH28*	DC20*		
		FT15*			SH16*		IE9*	
.60		FT24*			SH23*			
	EJ6*	SS13*		AR11*	DC17*	AR21*	DA29*	SS36*
.50		FT12*		DA7*	SH19*			EJ34*
		DA7		EJ34	SS13			
.40		SH19		EJ22*	AR21		DA26*	
	AR18	EJ6	EJ34	FT12	DA5*		IE8	SS13
+ .30		DC14	DA7	DA26			DC14	
	SS30						AR21	SS33
0	SS36						SH19	
− .30								
	DA29	DA5						
.40	DC32*							
	DC14*							
.50								
.60							SS33	
.70								
.80								
.90								
1.00								

Table 3.14

Varimax Rotated Factor Matrix
Setting the Number of Factors at Eight for
the Emotion Labeling Test

	F1	F2	F3	F4	F5	F6	F7	F8
+ 1.00								
.90								
.80	SS30*					EJ34*		
.70	SS13*	DA26*		DC17*			FT24*	DC14*
	EJ22*		IE9*		SH28*	EJ6*	FT15*	
.60		AR11*	AR21*	FT25*	SH23*	EJ10*		
.50		SS36*	SH19*	IE8*	FT12*			
			AR18*	DC20*	DA7*			
		FT12	IE31*					
.40			DC32*	DC32				
			AR27*					
+ .30	SH19	AR27		IE31		SS36		DA29
	IE8	SH19						SH28
	DA29							
0	- -							
- .30								
.40					DA29*			
					DC20			
					SS33*			
.50		IE35*						
.60								
.70								
.80							DA5*	SH16*
.90								
- 1.00								

Table 3.15

Contingency Table for Comparing Eight Factors with
Eight A Priori Categories for the
Emotion Recognition Test

	1	2	3	4	5	6	7	8
I-E			3				1	
E-J	2			1				1
S-S		1		1			1	1
D-H				1	1		2	
D-C	2				1	1		
A-R				2		2		
S-H					4			
F-T		3						1

Table 3.16

Contingency Table for Comparing Eight Factors with
Eight A Priori Categories for the
Emotion Labeling Test

	1	2	3	4	5	6	7	8
I-E		1	2	1				
E-J	1					3		
S-S	2	1			1			
D-A		1			2		1	
D-C			1	2				1
A-R		1	3					
S-H			1		2			1
F-T				1	1		2	

for factor eight. The varimax rotation with number of items

set at eight for the Labeling Test yielded the following

factor components: anger-rage, items 18, 21 and 27, for

factor three; disgust-contempt, items 17, 20 and 32, for

factor five; and enjoyment-joy, items 6, 10 and 34 for

factor six.

In general, results for the two factor analyses on both

tests indicate that the relationships found between factors

and items do not reflect all eight a priori categories used

in this study. Therefore, an additional factor analysis was

performed for three factors. A varimax rotation setting

the number of factors to three for both tests was performed

on the basis of Tomkins' (1962; 1963) classification of

facial expression of emotion. The three categories are:

positive, negative, and resetting. Interest-excitement and

enjoyment-joy are classified as positive, with surprise-

startle classified as resetting; and distress-anguish, fear-

terror, shame-humiliation, disgust-contempt and anger-rage

classified as negative affects.

The varimax rotation to three factors for the Recogni-

tion Test yielded the following item components with a

frequency of at least three for each factor: interest-

excitement, items 8, 21 and 35, for factor one; distress-

anguish, items 7, 26 and 29, for factor one; disgust-contempt,

items 14, 17 and 32, for factor one; all four surprise-

startle items for factor two; fear-terror, items 12, 15 and

25, for factor two; shame-humiliation, items 16, 19 and 23

for factor two. Contingency tables reflected the frequency
of items within the categories for the three factors are
Table 3.17 for the Recognition Test and Table 3.18 for the
Labeling Test. The varimax rotation to three factors did
not reflect the three a priori categories by Tomkins
(1962; 1963).

This rotation yielded the following factor components
with a frequency of at least three components for each fac-
tor on the Labeling Test: four surprise-startle items for
factor one; interest-excitement, items 8, 31 and 35, for
factor two; fear-terror, items 15, 24 and 25, for factor
three; and distress-anguish, items 5, 26 and 29, for fac-
tor three. Table 3.19 contains the factor loadings for the
Recognition Test, and Table 3.20 contains the factor loadings
for the Labeling Test.

The last factor analysis performed was a varimax
rotation for two factors, positive and negative, for both
tests. Positive affects defined as interest excitement,
enjoyment-joy, and surprise-startle. The negative affects
were defined as disgust-contempt, shame-humiliation, fear-
terror, distress-anguish, and anger-rage.
Tables 3.21 and 3.22 indicate that the positive and nega-
tive items did not comprise separate categories. Contin-
gency Tables 3.23 and 3.24 indicate the frequencies of
items within categories for each of the two factors. In
general, the two-factor rotation yielded the highest number
of items within a category comprising both of the two factors.

Table 3.17

Contingency Table for Comparing Three Factors with

Eight A Priori Categories for the Emotion Recognition Test

Category	1	2	3
IE	4		
EJ		2	2
SS		4	
DA	3		1
DC	3	1	
AR	1	1	2
SH	1	1	2
FT	1	1	2

Table 3.18

Contingency Table for Comparing Three Factors with

Eight A Priori Categories for the Emotion Labeling Test

Category	1	2	3
IE		3	1
EJ	4		
SS	4		
DA	1	2	1
DC		2	2
AR	2	1	1
SH	2		2
FT		1	3

Table 3.19

Varimax Rotated Factor Matrix
Setting the Number of Factors to Three
for the Emotion Recognition Test

	F1	F2	F3
+ 1.00			
.90			
.80			
.70	IE8* DA29*	EJ6*	
		AR18*	
.60	IE31*	EJ10*	AR27*
	DC14*		SH28*
.50	FT12* SH19* DC17*		EJ22* SH23* EJ34*
	DC32*	SS13* SS36*	AR11*
.40	IE35* AR21*	SS30* FT12	SS30
+ .30	DA26* EJ34 AR11	SS33* SH19	DA5*
	DA7*	DA7 SH23	
		DC20*	SS33 DC17
0	IE9*	SH16* FT25*	
− .30	FT15		
.40		FT15	FT15*
.50			FT24*
.60			
.70			
.80			
.90			
−1.00			

Table 3.20

Varimax Rotated Factor Matrix

Setting the Number of Factors to Three

for the Emotion Labeling Test

	F1	F2	F3
+ 1.00			
.90			
.80			
.70	SS30*		
	SS13*		FT24*
.60		AR11*	
	AR27* EJ22*		
.50	AR21* SS36*	DA26*	FT AR DA DC
	EJ6*		15* 18* 26 14*
.40			
+ .30	EJ10* 9* DC32 IE 31 DA 29*	EJ10 SS36 FT12*	FT IE DA DC 25* 31* 29 32*
	SS33*	DA7*	
0	EJ34*		
	SH23*	IE31	SH16* SH19*
- .30	SH28*		DA5*
.40		IE35* IE8*	
.50		DC17*	
.60		DC20*	
.70			
.80			
.90			
- 1.00			

Table 3.21

Varimax Rotated Factor Matrix

Setting the Number of Factors to Two

for the Emotion Recognition Test

	F1				F2			
+ 1.00								
.90								
.80								
.70								
	IE8*	DA29*						
.60	IE31*							
					EJ6*	SS30*		
.50						AR18*		
			SH19*	FT12*	EJ10*	SS13*	AR21*	SH23*
	DC14*	DC17*				SS33*	SS36*	SH28*
.40	AR11*		DC32*					
	IE35*	DA26*	EJ34*	DA7*	AR11		FT12	SH19
+ .30		EJ22*			DC20*	AR27*		FT25*
	IE27*	DA5*	FT15*				SH16*	FT24*
0								
- .30								
.40								
.50								
.60								
.70								
.80								
.90								
- 1.00								

Table 3.22

Varimax Rotated Factor Matrix
Setting the Number of Factors to Two
For the Emotion Labeling Test

	F1	F2
+1.00		
.90		
.80		
.70		
.60		
.50	SS30* AR27* EJ22* SS36*	
.40	EJ10* SS13* DA26*	IE31* DC17* DC20* DC32*
+.30	EJ6* AR11* DA29* AR21* FT12* SS33* SH19*	IE9* DC14* AR21 FT25* IE8* FT15* FT24*
0	EJ34* AR18*	IE35*
-.30	SH28*	DA5* DA7* SH16* SH23* AR11
.40		
.50		
.60		
.70		
.80		
.90		
-1.00		

Table 3.23

Contingency Table for Comparing Two Factors with

Eight A Priori Categories for the Emotion Recognition Test

Category	1	2
IE	4	
EJ	2	2
SS		4
DA	4	
DC	3	1
AR	1	3
SH	1	3
FT	2	2

Table 3.24

Contingency Table for Comparing Two Factors with

Eight A Priori Categories for the Emotion Labeling Test

Category	1	2
IE		4
EJ	4	
SS	4	
DA	2	2
DC		4
AR	4	
SH	2	2
FT	1	3

In summary, the factor analysis with no assumptions about expected structure, as well as the factor analyses preset to eight factors, were not reflective of the eight a priori categories. Additional factor rotations preset to three and two factors did not bear fruit either.

Design of the Study

The present study employs a multiple measures design for an age group main effect and a sex within age group effect across three measures. A pictorial representation of the design is presented in Table 3.25.

Analysis Procedures

A two-way multivariate analysis of variance was performed for age group effect with Planned Comparisons for the sex effect nested within each of the three age groups for the Emotion Labeling and Recognition Tests. In the event that Multivariate Analysis of Variance would result in significant differences at the .05 alpha level, a uni-variate analysis of variance for each of the eight emotion categories will be conducted to determine on which category (ies) the age groups and/or sexes within age group dif-ferences occurred at the .00625 alpha level. A .00625 alpha level for the univariate analyses was determined by distributing the .05 alpha level evenly across the eight categories. In cases where the univariate analyses would

Table 3.25

Design of the Study

			M1	M2	M3
			E1 E2 E3 E4 E5 E6 E7 E8	E1 E2 E3 E4 E5 E6 E7 E8	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10
P1	G1	S1 ⋮ S10			
	G2	S11 ⋮ S20			
P2	G1	S21 ⋮ S30			
	G2	S31 ⋮ S40			
P3	G1	S41 ⋮ S50			
	G2	S51 ⋮ S60			

P1 – 18-35 age group
P2 – 35-60 age group
P3 – 60+ age group
G1 – males
G2 – females
S – subject

E1 – Interest-Excitement
E2 – Enjoyment-Joy
E3 – Surprise-Startle
E4 – Distress-Anguish
E5 – Disgust-Contempt
E6 – Anger-Rage
E7 – Shame-Humiliation
E8 – Fear-Terror

M1 – Emotion Labeling Test
M2 – Emotion Recognition Test
M3 – Emotion Attitude Questionnaire

produce significant results at the .00625 level, a Scheffé Post Hoc will be performed to determine how the three age groups and/or sexes within age groups differed with respect to a particular category or categories.

The Chi-Square Test of Independence was utilized to determine differences between age groups for distributions of responses for any of the 10 questions on the Emotion Attitude Questionnaire. Data were organized on a bivariate frequency table to assess whether the age group variable was independent of the classification for the eight feeling categories for answers to any of the 10 emotion attitude questions. Alpha was set at a .005 level of signigicance. The alpha .005 was calculated by distributing the alpha .05 evenly for each of the 10 questions. In order to meet the assumptions of the Chi-Square Test, questionnaire response (column) totals less than three were dropped.

The Chi-Square Test of Independence was also utilized to determine differences between age group distributions for agreement between "emotion experienced most frequently" reported on the Emotion Attitude Questionnaire and emotion category with the highest score on the Emotion Recognition Test. Data were organized on a bivariate frequency table to assess whether the age group variable was independent of the classification for agreement between "emotion experienced most frequently" reported on the Emotion Attitude Questionnaire and emotion category with the highest score

on the Emotion Recognition Test. Alpha was set at .05 level of significance.

The Chi-Square Test of Independence was utilized to determine differences between age group distributions for agreement between "emotion experienced least frequently" reported on the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test. Data were organized on a bivariate frequency table to assess whether the age group variable was independent of the classification for agreement between "emotion experienced least frequently" reported on the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test. Alpha was set at .05 level of significance.

Controls and Limitations

Controls

The following variables were controlled during the selection and testing of subjects in order to diminish the chances of confounding the test results: all subjects were randomly selected from their living environments; all subjects were approached in person regarding their interest in participation; all subjects received the same tests in the same sequence; all test administrators received the same training program; all subjects were tested individually within a distraction-free environment; all subjects were

allowed a maximum of 60 seconds to respond to each item on the first test.

Limitations

Variables which could not be controlled were the following. Boredom experienced by some test administrators may have affected their attitudes toward the subjects and the testing process. The seven-month time span between the administration of the first and last subject tests may have implications regarding the effect of external historical events on the subjects' test performance. Faculty and staff contacted during Summer Term, 1976, were less willing to participate than faculty and staff contacted during Winter and Spring Terms, 1976. Some learning may have occurred for subjects taking the second test with the same set of photographs. Unavoidable malfunction of the test equipment resulted in delays in the testing procedure which may have left the subjects involved feeling frustrated and less interested in participating. A limitation for results of the Chi-Square Tests performed for Hypotheses 10 and 11 is the definition for "emotion category with the lowest score" and "emotion category with the highest score." There were instances where "highest score" or "lowest score" referred to more than one category at a time, because several categories were assigned the same highest or lowest score by subjects. In those instances, where several categories were tied, the category which matched

with the emotion answer for "emotion experienced most frequently" or "emotion experienced least frequently" was designated as highest or lowest score.

Summary

Sixty subjects were randomly selected to represent three different age groups: 18-35, 35-60, and 60+. Three different tests were administered to each of the 60 subjects individually: the Emotion Labeling Test, the Emotion Recognition Test, and the Emotion Attitude Questionnaire. A Hoyt (1941) homogeneity reliability, percentage of subject correct responses for categories and items within categories factor analyses, and inter-item and inter-category correlations were employed to assess the reliability of the Emotion Labeling and Recognition Tests.

The Labeling and Recognition Tests were estimated to be measuring separate constructs, while categories for both tests were determined to be discrete. Percentages of correct responses for categories and items within categories were calculated as indicators of reliability, when discrepancies between Homogeneity Reliability Coefficients and means for the enjoyment-joy category were discovered. The factor analyses performed to 8, 3 and 2 preset factors did not reflect those factors for the 32 items. The factor analysis performed with no assumptions for structure did not reflect Izard's 8 categories.

A multiple measures design was used for an age group main effect and a gender within age group effect across the three measures. A two-way multivariate analysis of variance was performed for an age group effect with planned comparisons for the gender nested within age group effect. Univariate analyses of variance and Scheffé post-hoc paired comparisons were planned to assess specific age group differences for the dependent variables if significance is found for the ANOVA. The Chi-Square Test of Independence was used to determine whether the age group variable was independent of the classification for the eight feeling categories for answers to any of the 10 questions on the Emotion Attitude Questionnaire. The Chi-Square test was used in two other instances. It was used to test for differences between age group distributions for agreement between "emotion experienced most frequently" answers from the Emotion Attitude Questionnaire and emotion category with the highest score on the Emotion Recognition Test. The Chi-Square test was also used to test for differences between age group distributions for agreement between "emotion experienced least frequently" answers from the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test.

Chapter IV

ANALYSIS OF THE DATA

An analysis of the data is presented in this chapter.
The data, analyses, and results relevant to each hypothesis
are discussed. The first eight hypotheses were tested by
a multivariate analysis of variance with planned compari-
sons for hypotheses 2, 3, 4, 6, 7, and 8. Hypotheses 9,
10, and 11 were tested by a Chi-Square Test of Independence.

Hypotheses Tested by a Multivariate Test

Ho_1: No differences will be found between age group mean
scores on the Emotion Labeling Test.

Ha_1: Differences will be found between age group mean
scores on the Emotion Labeling Test.

The null hypothesis was formulated to compare group
means between age groups 18-35, 35-60, and 60+ for the
Emotion Labeling Test (ELT). The alpha level was set at
.05. Significant differences were found between the three
age groups for mean scores on the Emotion Labeling Test
($F = 2.266$, $p < .008$). The cell means, cell standard
deviations and combined means for groups are reported in
Appendix D. Univariate analyses of variance were examined
at the .00625 level of significance to determine the
emotion category on which the three groups differed.

The .00625 alpha level was determined by dividing the .05 alpha level evenly across the eight measures for the emotion categories. The three age groups differed on responses to the distress-anguish category (F = 6.140, p ˂.004). The results for the univariate analyses are reported in Table 4.1.

Table 4.1

Univariate Analyses for Age Group Differences
on the ELT

Category	Hypothesis Mean Squares	Univariate F-Ratio	P less than
IE	2.817	1.916	.158
EJ	.600	.885	.419
SS	1.667	1.409	.253
DA	4.617	6.140	.004*
DC	2.317	1.629	.206
AR	3.050	2.718	.075
SH	1.317	2.673	.078
FT	1.717	1.184	.314

*Significant at alpha ˂ .00625

Code: IE - Interest-Excitement   DC - Disgust-Contempt
       EJ - Enjoyment-Joy   AR - Anger-Rage
       SS - Surprise-Startle   SH - Shame-Humiliation
       DA - Distress-Anguish   FT - Fear-Terror

Scheffé Post-Hoc comparisons were performed to determine how the mean scores for the three age groups

differed on the distress-anguish category. Significant mean score differences were found between the 60+ group and the 35-60 group, and also between the 60+ and the 18-35 groups. (Scheffé difference S =.55, p .00625) There were no mean score differences between the 18-35 and the 35-60 groups. The differences among the means for the three age groups on the distress-anguish variable are reported in Table 4.2.

Table 4.2

Scheffé Post-Hoc Mean Score Differences
for Age Groups on the ELT

	$\bar{X}_3$	$\bar{X}_2$	$\bar{X}_1$
$\bar{X}_3$ = 1.45	--	0.60*	0.95*
$\bar{X}_2$ = 2.05	--	--	0.35
$\bar{X}_1$ = 2.40	--	--	--

* Significant at alpha $<$ .00625

$\bar{X}_1$ - mean for 18-35 age group
$\bar{X}_2$ - mean for 35-60 age group
$\bar{X}_3$ - mean for 60+ age group

The results indicate significant differences between the three age groups; therefore, the null hypothesis was rejected in favor of the alternative hypothesis for the Emotion Labeling Test.

Ho_2: The mean score for females within age group 18-35 will not exceed the mean score for males within age group 18-35 on the Emotion Labeling Test.

Ha$_2$: The mean score for females within age group 18-
35 will exceed the mean score for males within age
group 18-35 on the Emotion Labeling Test.

The null hypothesis was tested at the .05 level of
significance. No significant differences were found for
the null hypothesis (F = .824, p <.586). The results
indicate that the null hypothesis was not rejected in
favor of the alternative hypothesis.

Ho$_3$: The mean score for females within age group 35-60
will not exceed the mean score for males within age
group 35-60 on the Emotion Labeling Test.

Ha$_3$: The mean score for females within age group 35-60
will exceed the mean score for males within age
group 35-60 on the Emotion Labeling Test.

The null hypothesis was tested at the .05 level of
significance. No significant differences were found for
the null hypothesis (F = .687, p <.701). The results in-
dicate that the null hypothesis failed to be rejected in
favor of the alternative hypothesis.

Ho$_4$: The mean score for females within the age group 60+
will not exceed the mean score for males within age
group 60+ on the Emotion Labeling Test.

Ha$_4$: The mean score for females within age group 60+
will exceed the mean score for males within age
group 60+ on the Emotion Labeling Test.

The null hypothesis was tested at the .05 level of
significance. No significant differences were found for

the null hypothesis (F = 1.469, p < .194). The results indicate that the null hypothesis failed to be rejected in favor of the alternative hypothesis. A summary of multivariate test findings for age and sex within age group differences on the ELT is presented in Table 4.3.

Table 4.3

Multivariate Tests for Age and Sex within Age Group
Differences on the ELT

Sources of Variance	F-Ratio	P less than
Age	2.266*	.008
Sex within 18-35 group	.824	.586
Sex within 35-60 group	.687	.701
Sex within 60+ group	1.469	.194

* Significant at alpha < .05

Ho_5: No differences will be found between age group mean scores on the Emotion Recognition Test.

Ha_5: Differences will be found between age group mean scores on the Emotion Recognition Test.

The null hypothesis was formulated to compare group means between age groups 18-35, 35-60, and 60+ for the Emotion Recognition Test (ERT). The alpha level was set at .05. Significant differences were found between the

three age groups for mean scores on the Emotion Recognition Test ($F = 2.543$, $p < .003$). The cell means, cell standard deviations and combined means for groups are reported in Appendix D. Univariate analyses of variance were performed at the .00625 level of significance to determine the emotion category on which the three groups differed. The .00625 alpha level was determined by dividing the .05 alpha level evenly across the eight measures for the emotion categories. The three age groups differed on responses to the distress-anguish category ($F = 10.921$, $p < .0002$). The results of the univariate analyses are reported in Table 4.4.

Table 4.4

Univariate Analyses for Age Group Differences
on the ERT

Category	Hypothesis Mean Squares	Univariate F-Ratio	P less than
IE	2.217	1.569	.218
EJ	1.067	4.056	.023
SS	3.267	3.133	.052
DA	10.517	10.921	.0002*
DC	3.467	2.454	.096
AR	5.217	4.719	.013
SH	7.217	4.656	.014
FT	.067	.051	.951

* Significant at alpha .00625

IE - Interest-Excitement   DC - Disgust-Contempt
EJ - Enjoyment-Joy   AR - Anger-Rage
SS - Surprise-Startle   SH - Shame-Humiliation
DA - Distress-Anguigh   FT - Feat-Terror

Scheffé Post-Hoc comparisons were performed to determine how the mean scores for the three age groups differed on the distress-anguish variable. Significant mean score differences were found among all three groups (Scheffé Difference S =.59, p <.00625). The mean scores between the 18-35 and the 35-60 groups were significantly different along with the mean scores between the 18-35 and the 60+ groups and the 35-60 and 60+ groups on the distress-anguish variable. The differences between the means for all three age groups on the distress-anguish variable are reported in Table 4.5. The results indicate significant differences among the three age groups; therefore, the null hypothesis was rejected in favor of the alternative hypothesis for the Emotion Recognition Test.

Table 4.5

Scheffé Post-Hoc Mean Score Differences
for Age Groups on the ERT

	$\bar{X}_3$	$\bar{X}_2$	$\bar{X}_1$
$\bar{X}_3$ = 1.75	--	0.70**	1.45**
$\bar{X}_2$ = 2.45	--	--	0.75**
$\bar{X}_1$ = 3.20	--	--	--

* Significant at alpha <.00625

Code: $\bar{X}_1$ - mean for 18-35 group
    $\bar{X}_2$ - mean for 35-60 group
    $\bar{X}_3$ - mean for 60+ group

—

Ho$_6$: The mean score for females within age group 18-35
will not exceed the mean score for males within age
group 18-35 on the Emotion Recognition Test.

Ha$_6$: The mean score for females within age group 18-35
will exceed the mean score for males within age
group 18-35 on the Emotion Recognition Test.

The null nypothesis was tested at the .05 level of
significance. No significant differences were found for
the null hypothesis (F = .460, p<.878). The results
indicate that the null hypothesis failed to be rejected in
favor of the alternative hypothesis.

Ho$_7$: The mean score for females within age group 35-60
will not exceed the mean score for males within age
group 35-60 on the Emotion Recognition Test.

Ha$_7$: The mean score for females within age group 35-60
will exceed the mean score for males within age
group 35-60 on the Emotion Recognition Test.

The null hypothesis was tested at the .05 level of
significance. No significant differences were found for
the null hypothesis (F = .891, p<.531). The results
indicate that the null hypothesis failed to be rejected
in favor of the alternative hypothesis.

Ho$_8$: The mean score for females within age group 60+
will not exceed the mean score for males within age
group 60+ on the Emotion Recognition Test.

Ha$_8$: The mean score for females within age group 60+
will exceed the mean score for males within age

group 60+ on the Emotion Recognition Test.

The null hypothesis was tested at the .05 level of significance. No significant differences were found for the null hypothesis (F = 1.209, p < .315). The results indicate that the null hypothesis failed to be rejected in favor of the alternative hypothesis. A summary of multivariate test findings for age and sex within age differences on the Emotion Recognition Test (ERT) is presented in Table 4.6.

Table 4.6

Multivariate Test for Age and Sex Within Age Group
Differences on the ERT

Sources of Variance	F-Ratio	P less than
Age	2.543*	.003
Sex within 18-35 group	.460	.878
Sex within 35-60 group	.891	.531
Sex within 60+ group	1.209	.315

* Significant at alpha < .05

Hypotheses Tested by a

Chi-Square Test of Independence

Ho_9: No differences will be found between age group distributions of responses for any of the 10 questions on the Emotion Attitude Questionnaire.

Ha_9: Differences will be found between age group distributions of responses for any of the 10 questions on the Emotion Attitude Questionnaire.

The null hypothesis was tested at .005 level of significance for each of the 10 questions. Alpha .005 was determined by dividing .05 alpha evenly among the 10 questions. Data were organized on a bivariate frequency table to assess whether age and emotion were independent on each of the questions for the Emotion Attitude Questionnaire (EAQ). Column totals (questionnaire response totals) with cells having less than three subjects were eliminated for the Chi-Square computations. Significant differences for the null hypothesis were found among age groups for answers to question 10 on the Emotion Attitude Questionnaire (X^2 = 10.65, p < .005). The Chi-Square table for Hypothesis 9 is Table 4.7. Question 10 was:

10. Indicate the degree to which you understand yourself, your own personality.

5	4	3	2	1
Perfectly		Average		Not at all

(Subjects placed a check mark in the appropriate space on the scale.)

Table 4.7

Chi-Square Table for Hypothesis 9

Question	χ^2	df	Critical χ^2	Decision
Q1	0.32	2	10.60	NSD*
Q2	4.92	6	18.55	NSD
Q3	5.33	6	18.55	NSD
Q4	16.85	8	21.96	NSD
Q5	1.74	2	10.60	NSD
Q6	2.35	4	14.80	NSD
Q7	9.73	2	10.60	NSD
Q8	1.49	6	18.55	NSD
Q9	8.82	2	10.60	NSD
Q10	10.65	2	10.60	Significant at $\alpha = .005$

* NSD - No Significant Differences

The Chi-Square table for observed frequencies between the three age groups for answers to Question 10, after eliminating columns with fewer than three subjects, is reported in Table 4.8. See Appendix for contingency tables for all 10 questions. The results indicate significant differences between the age group for answers to question 10; therefore, the null hypothesis was rejected in favor of the alternative.

Table 4.8

Distribution of Responses for Three Age Groups

on EAQ Question 10

Age Group	Level 3	Level 4
18-35	3	15
35-60	11	9
60+	13	6

$$x^2 = 10.65, \; p \; .005$$

Code: Levels 3 & 4 - scale answer given to question 10

Ho_{10}: No differences will be found between age group
distributions for agreement between "emotion
experienced most frequently" reported on the
Emotion Attitude Questionnaire and emotion category
with the highest score on the Emotion Recognition
Test.

Ha_{10}: Differences will be found between age group dis-
tributions for agreement between "emotion exper-
ienced most frequently" reported on the Emotion
Attitude Questionnaire and emotion category with
the highest score on the Emotion Recognition Test.

The null hypothesis was tested at the .05 level of
significance. No significant differences were found for
the null hypothesis ($x^2 = .914$, p approximately .60).

Answers to "emotion experienced most frequently" which were in agreement with category receiving the highest score on the Emotion Recognition Test (ERT) are reported for each of the three age groups in Table 4.9. No significant differences were found for the null hypothesis at the .05 alpha level (x^2 = .914, p approximately .60); therefore, the null hypothesis failed to be rejected in favor of the alternative hypothesis.

Table 4.9

Age Group Distributions for Agreement
Between ERT and EAQ for Ho_{10}

	No. In Agreement	No. Not In Agreement
18-35	10	10
35-60	12	8
60+	9	11

x^2 = .914, p approximately .60

Ho_{11}: No differences will be found between age group distributions for agreement between "emotion experienced least frequently" reported on the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test.

Ha_{11}: Differences will be found between age group distributions for agreement between "emotion experienced

least frequently" reported on the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test.

The null hypothesis was tested at the .05 level of significance. No significant differences were found for the null hypothesis (x^2 = .185, p approximately .90). Age distributions for agreement between "emotion experienced least frequently" on the Emotion Attitude Questionnaire (EAQ) and emotion category with the lowest score on the Emotion Recognition Test (ERT) are reported in Table 4.10.

Table 4.10

Age Group Distributions for Agreement
Between ERT and EAQ for Ho_{11}

	No. In Agreement	No. Not In Agreement
18-35	5	10
35-60	5	10
60+	4	16

$$x^2 = .185, \text{ p approximately .90}$$

No significant differences were found for the null hypothesis at the .05 alpha level (x^2 = .185, p approximately .90); therefore, the null hypothesis failed to be rejected in favor of the alternative hypothesis.

Summary

A multivariate test was used to test mean score differences between age groups 18-35, 35-60, and 60+ on the Emotion Labeling Test with alpha set at .05. The null hypothesis that there would be no differences between age groups was rejected ($p < .008$). In the univariate analyses with alpha set at .00625, the age group means were found to be significantly different on the distress-anguish category ($p < .004$). Scheffé Post-Hoc Paired Comparisons with alpha set at .00625 were used to test how the means for the three age groups differed on the distress-anguish variable. Significant differences for the 60+ group in comparison with both the 18-35 and the 35-60 groups were found ($p < .00625$) for the Scheffé Post-Hoc Paired Comparisons. Labels generated by subjects for the items within the distress-anguish category are reported in Appendix F.

A multivariate test with planned comparisons was performed to test mean score differences for sex within each of the three age groups on the Emotion Labeling Test with alpha set at .05. The null hypothesis that female mean scores would not exceed male mean scores within the 18-35 group failed to be rejected ($p < .586$). The null hypothesis that female mean scores would not exceed male mean scores within the 35-60 group failed to be rejected ($p < .701$). The null hypothesis that female mean scores

would not exceed male mean scores within the 60+ group
failed to be rejected (p $<$ .194).

A multivariate test was used to test mean score
differences between age groups 18-35, 35-60, and 60+ on
the Emotion Recognition Test with alpha level set at .05.
The null hypothesis that there would be no differences
between age groups was rejected (p $<$ .003). In the uni-
variate analyses with alpha set at .00625, age group means
were found to be significantly different on the distress-
anguish variable (p $<$ .0002). Scheffé post-hoc paired
comparisons with alpha set at .00625 were used to test how
the means for the three age groups differed on the distress-
anguish variable. Significant differences between all
three age groups were found at alpha level .00625.

Further exploration of the data revealed the categories
which subjects used for most of the incorrect responses
assigned to the distress-anguish category. Most of the
incorrect responses used by the 60+ group for the distress-
anguish items were interest-excitement, surprise-startle,
and shame-humiliation. Incorrect responses frequently used
by the 35-60 group to describe distress-anguish photos were
shame-humiliation. Most of the incorrect responses used
by the 18-35 group for the distress-anguish category were
fear-terror and anger-rage. Appendix F illustrates the
correct and incorrect responses used for the 32 photo-
graphs by the three age groups for both tests.

A Chi-Square Test of Independence was used to test differences for age group distributions of responses to the Emotion Attitude Questionnaire with alpha set at .05. The null hypothesis that there would be no differences between age group distributions for responses to the Emotion Attitude Questionnaire was rejected for Question 10: Indicate the degree to which you understand yourself, your own personality (p < .005).

A Chi-Square Test of Independence was used to test differences between age group distributions for agreement between "emotion experienced most frequently" reported on the Emotion Attitude Questionnaire and emotion category with the highest score on the Emotion Recognition Test with alpha set at .05. No significant differences were found for the null hypothesis; therefore, the null failed to be rejected in favor of the alternative hypothesis.

A Chi-Square Test of Independence was used to test differences between age group distributions for agreement between "emotion experienced least frequently" reported on the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test with alpha set at .05. No significant differences were found for the null hypothesis; therefore, the null failed to be rejected in favor of the alternative hypothesis.

Chapter V

SUMMARY, CONCLUSIONS, AND DISCUSSION

In this chapter, a summary of the study is presented
and the conclusions of the data analysis are examined. A
discussion of the implications for further research is
also included.

Summary

The purpose of this study was twofold: to compare
the emotion recognition and labeling behaviors of 60 subjects
from age groups 18-35, 35-60, and 60+ and genders within
these age groups to Izard's photographs of facial expression
of emotion; and to compare the attitudes of these age
groups to the eight emotion categories depicted in these ,
32 photographs. Subjects representing the 18-35 age group
were randomly selected from a list of graduate and under-
graduate students residing in the graduate and one of the
undergraduate residence halls at Michigan State University.
Subjects representing the 35-60 age group were randomly
selected from a list of faculty and staff employed at
Michigan State University. Those subjects representing
the 60+ age group were randomly selected from a list of

ambulatory residents of a retirement center in East Lansing,
Michigan. The WAIS vocabulary subtest was administered
to subjects from the latter group prior to their partici-
pation in the study; all subjects in this age group
scored average to superior.

The 60 subjects responded to three different tests
during the course of the study: an Emotion Labeling Test,
an Emotion Recognition Test, and an Emotion Attitude
Questionnaire; all three tests were modifications of
three cross-cultural experiments developed by Izard (1971).
During the administration of the Emotion Labeling Test and
the Emotion Recognition Test, subjects responded to slides
of photographs of facial expression which were cross-
culturally validated with eight emotion categories:
interest-excitement, enjoyment-joy, surprise-startle,
distress-anguish, disgust-contempt, anger-rage, shame-
humiliation, and fear-terror (Izard, 1971). Subjects
responded to the labeling test by generating and writing
their own labels for the emotions posed in the slides.
Responses to the recognition task were made by matching
one of the eight emotion categories with a given slide
number. The attitude questionnaire included questions
regarding the personal experiences of the subjects with
the eight categories. All three tests were administered
to subjects individually and within the same one-and-one-
half-hour sitting by one of thirteen volunteer test
administrators.

Subject responses to the Labeling Test were scored
by five raters according to the eight categories, their
a priori definitions and synonyms. A criterion of four
out of five rater agreement was decided upon prior to the
rating of the 1,920 subject responses to the 32 photographs.
Four out of five rater agreement was required for deciding
the correctness or incorrectness of a subject response;
items receiving three out of five rater agreement were
scored incorrect. Rating the 1,920 responses yielded four
out of five rater agreement on 93 percent of the 1,920
subject responses--a remarkably high percentage of agreement.

Prior to testing the hypotheses related to the pur-
poses of the study, the eight emotion categories and the
four items within each category were assessed to determine
their reliability.

Assessment of the Instrument

A Homogeneity Reliability was performed for the four
items/photographs within each of the eight emotion cate-
gories for the Emotion Labeling and the Emotion Recognition
Tests. A coefficient of reliability computed by Hoyt's
(1941) analysis of variance method is considered a co-
efficient of equivalence which indicates how nearly the
four items/photographs for each of the eight categories
agree or measure the same construct.

Items within a category estimated to have a homogeneity
coefficient of .40 or less were considered to be lacking in

homogeneity. Items within six categories for the Labeling
Test received homogeneity coefficients greater than .40;
the two categories with coefficients less than .40 were
distress-anguish (indeterminate) and shame-humiliation (.07).
Items within six categories for the Recognition Test
yielded coefficients greater than .40; the two categories
with coefficients less than .40 were enjoyment-joy (.30)
and distress-anguish (.37). Items within the shame-
humiliation category for the Emotion Recognition Test
received the highest homogeneity coefficient (.65) and
were considered to have a greater degree of homogeneity
than items for the other categories on both tests. Co-
efficients for both tests indicated that the four items
within each category on both tests were generally not
measuring unidimensional constructs. The homogeneity
coefficients for categories within the Recognition Test
were generally higher than homogeneity coefficients for the
Labeling Test.

The Hoyt Homogeneity Reliability Coefficients were
considered questionable assessments of the reliability of
items within categories for both tests, because a dis-
crepancy between high mean scores and a low homogeieity
cofficient for the enjoyment-joy category within the
Recognition Test was discovered. A Spearman Rank Order
Correlation yielded a .77 correlation between ranked
category variances and reliability coefficients. Therefore,

percentage of correct responses for categories and items within categories was chosen as an alternative indicator of reliability.

Categories for both tests were ranked from highest to lowest percentage of correct responses: enjoyment-joy, surprise-startle, anger-rage, interest-excitement, distress-anguish, fear-terror, disgust-contempt, and shame-humiliation. There was less variation in percentage of correct responses for items within the interest-excitement and enjoyment-joy categories (both tests) in comparison with the other six categories. In general, there was a higher number of correct responses for items and categories on the Recognition Test.

In addition to examining subject responses to categories and items within categories for both tests, patterns of responses to items for each category were explored to determine specific items which consistencly received incorrect responses in combination with items which received correct responses. Information gathered from examining patterns of incorrect and correct responses was in agreement with percentage of correct responses for items within categories. For example, there was a low percentage of correct responses for items 33 and 36 within the surprise-startle category along with a higher percentage of correct responses for items 13 and 30 in that same category for both tests.

The relationships between categories for both tests were determined by performing inter-category correlations. The results indicated that categories for both tests were distinct, with minimal overlap. Inter-item correlations comparing the same item on both tests resulted in low correlations, indicating that both tests measured different constructs.

In conclusion, the assessment of the instrument indicated that the Labeling and Recognition Tests were measuring different constructs and both tests consisted of discrete categories, while items within the interest-excitement and enjoyment-joy categories appeared to be measuring unidimensional constructs to a greater degree than other categories on both tests.

In order to assess the instrument further, factor analyses were performed to determine whether the correlations between the 32 items with each other would result in a factor structure reflective of the eight a priori categories. A principal components factor analysis with no assumptions about expected structure was performed with the eigen value set at 1.00, followed by a varimax rotation setting the number of factors to eight. This two-part process was performed for both tests.

In general, results for the two factor analyses on both tests indicate that the relationships found between factors and items did not reflect all eight a priori

categories used in this study. Therefore, an additional
factor analysis was performed for three factors. A vari-
max rotation setting the number of factors to three for
both tests was performed on the basis of Tomkins' (1962;
1963) classification of facial expression of emotion. The
three categories are: positive, negative, and resetting.
Interest--excitement and enjoyment-joy are classified as
positive, with surprise-startle classified as resetting,
and distress-anguish, fear-terror, shame-humiliation,
contempt-disgust and anger--rage classified as negative
affects. The varimax rotation to three factors did not
reflect the three a priori categories by Tomkins (1962;1963).

The last factor analysis performed was a varimax
rotation for two factors, positive and negative, for both
tests. Distinguishing between two major categories of
emotion, such as positive or negative (Izard and Dunnally,
1965) and pleasantness-unpleasantness or attention-rejection
(Schlosberg, 1941), has been a popular way to classify
facial expression of emotion as belonging to two discrete
categories or two major categories on a continuum. Although
Izard does not classify the eight emotion categories
according to two major categories, it seemed that since
the factor analysis rotated to three factors did not
reflect the three categories by Tomkins (1962; 1963),
presetting the number of factors at two was worth a try.
Positive affects were defined as interest-excitement,

enjoyment-joy, and surprise-startle. The negative affects were defined as disgust-contempt, shame-humiliation, fear-terror, distress-anguish, and anger-rage. The varimax rotation did not reflect the two categories.

In summary, the factor analysis with no assumptions about expected structure, as well as the factor analyses preset to eight factors, were not reflective of the eight a priori categories. Additional factor rotations preset to three and two factors did not bear fruit either.

Analysis of the Data

A multivariate test was used to test mean score differences between age groups 18-35, 35-60, and 60+ on the Emotion Labeling Test with alpha set at .05. The null hypothesis that there would be no differences between age groups was rejected ($p < .008$). In the univariate analyses with alpha set at .00625, the age group means were found to be significantly different on the distress-anguish category ($p < .004$). Scheffé post-hoc paired comparisons with alpha set at .00625 were used to test how the means for the three age groups differed on the distress-anguish variable. Significant differences for the 60+ group in comparison with both the 18-35 and the 35-60 groups were found ($p < .00625$) for the Scheffé post-hoc paired comparisons. Labels generated by subjects for the items within the distress-anguish category are reported in Appendix F.

A multivariate test with planned comparisons was performed to test mean score differences for sex within

each of the three age groups on the Emotion Labeling Test with alpha set at .05. The null hypothesis that female mean scores would not exceed male mean scores within the 18-35 group failed to be rejected (p<.586). The null hypothesis that female mean scores would not exceed male mean scores within the 35-60 group failed to be rejected (p<.701). The null hypothesis that female mean scores would not exceed male mean scores within the 60+ age group failed to be rejected (p<.194).

A multivariate test was used to test mean score differences among age groups 18-35, 35-60, and 60+ on the Emotion Recognition Test with alpha level set at .05. The null hypothesis that there would be no differences among age groups was rejected (p<.003). In the univariate analyses with alpha set at .00625, age group means were found to be significantly different on the distress-anguish variable (p<.0002). Scheffé Post-Hoc Paired Comparisons with alpha set at .00625 were used to test how the means for the three age groups differed on the distress-anguish variable. Significant differences among all three age groups, i.e., comparisons between 18-35 and 60+, 35-60 and 60+, and 18-35 and 35-60, were found at alpha level .00625.

Further exploration of the data revealed the categories which subjects used for most of the incorrect responses assigned to the distress-anguish category. Most of the incorrect responses used by the 60+ group for the

distress-anguish items were interest-excitement, surprise-
startle, and shame-humiliation. Incorrect responses
frequently used by the 35-60 group to describe distress-
anguish photos were shame-humiliation responses. Most of
the incorrect responses used by the 18-35 group for the
distress-anguish category were fear-terror and anger-rage.

A Chi-Square Test of Independence was used to test
differences for age group distributions of responses to
assess whether age and emotion were independent on each of
the questions on the Emotion Attitude Questionnaire with
alpha set at .05. The null hypothesis that there would be
no differences between age group distributions for responses
to the Emotion Attitude Questionnaire was rejected for
Question 10: Indicate the degree to which you understand
yourself, your own personality (p $<$ .005).

A Chi-Square Test of Independence was used to test
differences between age group distributions for agreement
between "emotion experienced most frequently" reported on
the Emotion Attitude Questionnaire and emotion category
with the highest score on the Emotion Recognition Test with
alpha set at .05. No significant differences were found
for the null hypothesis; therefore, the null failed to be
rejected in favor of the alternative hypothesis.

A Chi-Square Test of Independence was used to test
differences between age group distributions for agreement
between "emotion experienced least frequently" reported on

the Emotion Attitude Questionnaire and emotion category with the lowest score on the Emotion Recognition Test with alpha set at .05. No significant differences were found for the hull hypothesis; therefore, the null failed to be rejected in favor of the alternative hypothesis.

Conclusions

Although the reliability of the items/photographs for categories other than enjoyment-joy and interest-excitement was questionable, significant age group differences occurred for the Labeling and Recognition Tests on the distress-anguish category. The means for the three groups were ranked from the highest to lowest with the highest mean scores for the youngest group. The 60+ age group received the lowest mean scores for this category.

How can the significant differences be accounted for when the reliability of the instrument was low? The distress-anguish items on both tests received two of the lowest Hoyt Reliability Coefficients computed, i.e., Labeling (indeterminate) and Recognition (.30). Distress-anguish items also received two of the lower percentages of correct responses for that category on both tests: Labeling (49.00) and Recognition (61.25). Further examination of these four items revealed that patterns of responses to the items resulted in fewest totally correct (1111) and fewest totally incorrect (0000). Items which

received the most incorrect responses from the 60+ age group
were items 5 and 7, which appear to be poses depicting less
facial musculature movement than items 26 and 29.

Given that significant age group mean score differences
exist for items within a category which has been estimated
to have low reliability, it is difficult to determine what
age group mean differences reflect.

Since the mean scores for the 60+ age group were the
significantly lowest mean scores for both tests, in com-
parison with the other two groups, their low mean scores
may possibly reflect the manner in which the subjects
within this group cope with the stresses characteristic
of their developmental stage.

. The 60+ age group, labeled as later maturity by
Havighurst (1952), is characterized by loss of status. Loss
of status refers to decreasing physical strength and im-
paired health, reduced income, adjustment to the death of
a spouse or friends, and adjustment to retirement. It
seems that the great number of adjustments which indivi-
duals within thie age group exprience could evoke stress,
a denial of stress, or an acceptance of stress as an
integral part of life.

Developmentally, the capacity to cope with and recog-
nize stress cues in others may decrease with an increase in
age. Since our culture tends to be youth oriented, "the
Pepsi generation," there may be fewer alternatives available

to assist individuals within the 60+ generation with
experiencing, communicating, and recognizing stress. More
subjects within the 60+ age group reported that they
understand themselves and their personalities to a lesser
degree than subjects from the other two age groups. These
significant age differences for answers to the question:
"How well do you understand yourself, your own personality?"
may mean that individuals within this group do not avail
themselves of ways in which to deal with the stresses of
their age group, or it may also mean that understanding
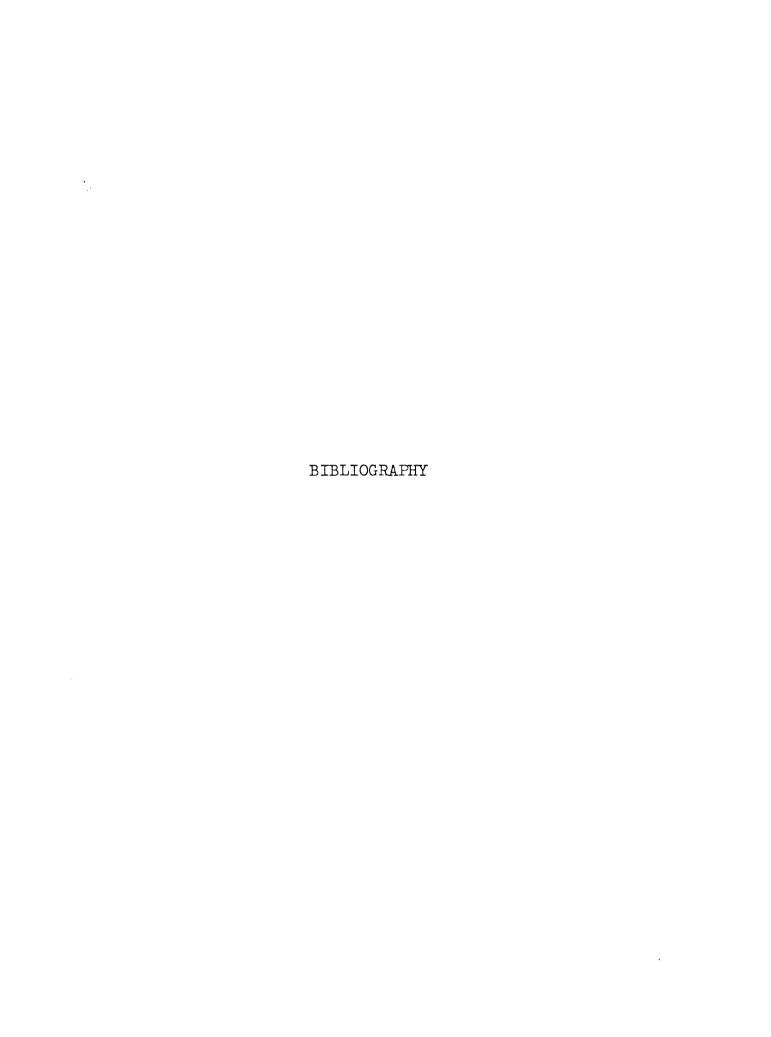self is less important to them in comparison with other
priorities.

No significant sex differences were found for responses
to photographs for both tests. The participants in the
study were living within or near a university campus, and
most of them were university students or university
graduates. Given their academic backgrounds and exposure
to a variety of values and attitudes, subjects for this
study probably use a variety of labels for feelings. They
are less likely to be locked into "male words" or "female
words." These results are in agreement with the findings
of Black (1969), Gitter (1972) and Westbrook (1974).

Discussion

Research with photographs of facial expression of
emotion usually results in higher percentage of correct

responses for the recognition task since this task does
not allow for connotative differences found in the use of
free labels. Perhaps this test alone would be sufficient
for assessing the recognition of emotion in facial ex-
pression. Exploring the process which subjects go through
in identifying the photographs may have been useful infor-
mation, e.g., empathic imitation, cognitive associations--
a process explored by Langfeld (1918). While examining
the subject responses to the modified emotion attitude
questionnaire used in this study, it seems that Izard's
original questionnaire might have provided more information
regarding preferred and dreaded emotions. His questions
are graded, allowing subjects more time to think through
their preferred and dreaded emotions.

Izards' photographs received higher percentages of
agreement for the eight emotion categories by subjects who
participated in the cross-cultural studies than subjects
who participated in the present study. Possible explana-
tions for the discrepancy may be: Izard's subjects were
tested within groups, while subjects within this study
were tested individually--there may have been a group
effect operating; Izard's subjects ranged in ages comparable
to the youngest sample age group (18-35) for this study.
If the photographs were more reliable and valid represen-
tatives of the eight categories for this sample of three
age groups, significant age group differences may have
occurred for more categories.

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APPENDIX A

SUBJECT TEST PACKET

FACIAL AFFECT STUDY CONSENT FORM

_____
Name of Subject

I have agreed to participate in a study involving the
labeling and recognition of facial affect. This study is
being conducted by Margaret Zerba for the purpose of ful-
filling the research goals of her Doctoral dissertation.
With the understanding that my personal identity will
remain confidential, I agree that the information collected
during this study will be available for the investigator
to us' in scientific publications. I am aware that the
results of the measurement and testing procedures will be
made available to me upon request. I understand that I
may ask any questions regarding the test procedures. I
also understand that I may withdraw from the study at any
time.

_____   _____
Witnessed (Test Administrator)   Signature (Subject)

_____   _____
Dated   Dated

QUESTIONNAIRE

1. Number: _____

2. Age: _____

3. Sex: _____Male _____Female

4. Marital Status: ____Single ____Married ____Widowed

   _____Divorced

5. Occupation: _____

6. Employment Status: ____Working full time

   _____Working part time

   ____Not working

7. Yearly Gross Family Income Level (U.S. Bureau of the Census):

   ____Under $3,000

   ____$3,000 - $4,999

   ____$5,000 - $6,999

   ____$7,000 - $9,999

   ____$10,000 - $14,999

   ____$15,000 and over

8. Education:

   ____More than 4 years of college

   ____4 years of college completed

   ____Some college

   ____High school completed

   ____Some high school

   ____Eight grades completed

   ____Less than 8 grades

EMOTION LABELING EXPERIMENT

Instructions

In a few minutes I am going to show you 36 photographs of people who are expressing a variety of emotions. Some of the people are expressing a certain emotion; others are expressing another emotion, others still another, etc.

The purpose of this experiment is to see if the photographed people succeeded in expressing the various emotions clearly. We can estimate this by determining the extent to which people agree on the emotion expressed in each picture.

When I project a picture on the screen/wall, look at it carefully, then describe what the person in the photo seems to be feeling. In some photos you may judge that more than one emotion is apparent. However, decide which one emotion is expressed more strongly and more clearly and write this down first; then record the other feeling(s) and say whatever else you wish to make clear what the person is expressing. You will have a maximum of 60 seconds to look at each picture and record your answer(s) for each picture.

Remember, in the space provided on the answer sheet, describe first the strongest and clearest feeling that the person in the photo is expressing; then describe what other feeling(s), if any, appear to be expressed. Do not worry about spelling.

Once the tester starts showing the slides, he/she will not answer any questions until all 36 slides have been shown.

(Taken from <u>Face of Emotion</u> by Carroll E. Izard)

EMOTION LABELING EXPERIMENT

Answer Sheet

Photo No.	Name or description of the emotion expressed; how is this person feeling?
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	
21.	

EMOTION LABELING EXPERIMENT

Answer Sheet

Photo No.	Name or description of the emotion expressed; how is this person feeling?
22.	
23.	
24.	
25.	
26.	
27.	
28.	
29.	
30.	
31.	
32.	
33.	
34.	
35.	
36.	

EMOTION RECOGNITION EXPERIMENT

Instructions

In a few minutes I am going to show you the photographs
again. This time when I project photograph number 1 on the
screen/wall, look first at the photograph, then at the list
of emotions provided you. The list contains eight emotions
emotions, numbered 1 to 8. Select the one emotion that
best describes the photo, then write the number of the
picture below the selected emotion in one of the spaces
after: "Photo No." You will have a maximum of 60 seconds
to look at each photo and write its number below.

Thus, for each photo decide what emotion it expresses
best, then write the number of this photo in the appropriate
space under that emotion.   Do not worry about the number
of responses you give to each category; the number of
responses to categories may vary widely.

First, take a few minutes to study the names and
definitions of the eight emotions so you will be familiar with
all of them and so you can easily locate the right space
to record your answer (the picture number).

EMOTION RECOGNITION EXPERIMENT

Answer Sheet

1. INTEREST-EXCITEMENT: Concentrating, attending, attracted, curious

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

2. ENJOYMENT-JOY: Glad, merry, delighted, joyful

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

3. SURPRISE-STARTLE: Sudden reaction to something un-expected, astonished

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

4. DISTRESS-ANGUISH: Sad, unhappy, miserable, feels like crying

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

5. DISGUST-CONTEMPT: Sneering, scornful, disdainful, revulsion

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

6. ANGER-RAGE: Angry, hostile, furious, enraged

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

7. SHAME-HUMILIATION: Embarrassed, ashamed, guilty, shy

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

8. FEAR-TERROR: Scared, afraid, terrified, panicked

Photo No.: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

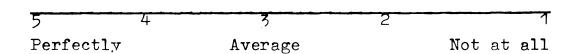## AN EMOTION ATTITUDE QUESTIONNAIRE

Please answer the following questions about the eight emotions and your experiences with them. The letters, names, and definitions of the eight emotions are listed here; write the number of your answer next to each question in the space provided. Be sure to write just one number for each question. You will have a maximum of 10 minutes to complete this questionnaire.

1. INTEREST-EXCITEMENT: Concentrating, attending, attracted, curious
2. ENJOYMENT-JOY: Glad, merry, delighted, joyful
3. SURPRISE-STARTLE: Sudden reaction to something unexpected, astonished
4. DISTRESS-ANGUISH: Sad unhappy, miserable, feels like crying
5. DISGUST-CONTEMPT: Sneering, scornful, disdainful, revulsion
6. ANGER-RAGE: Angry, hostile, furious, enraged
7. SHAME-HUMILIATION: Embarrassed, ashamed, guilty, shy
8. FEAR-TERROR: Scared, afraid, terrified, panicked

Question No.   Emotion No.

1. Which emotion do you experience most frequently?

2. Which emotion do you experience least frequently?

3. Which emotion do you dread the most?

4. Which emotion do you dread next most?

5. Which emotion do you most prefer to experience

6. Which is your second preference?

7. Which emotion do you assume others see you experience most frequently?

8. Which emotion do you assume others see you experience least frequently?

9. Indicate by checking (✓) in the appropriate space on the scale below the degree to which you understand the emotions you, yourself, experience:

5	4	3	2	1
Perfectly		Average		Not at all

AN EMOTION ATTITUDE QUESTIONNAIRE
(Continued)

10. Indicate the degree to which you understand yourself,
    your own personality:

```
5           4           3           2           1
Perfectly            Average            Not at all
```

APPENDIX B

SCORING MATERIALS FOR RATERS

MASTER LIST FOR CORRECT RESPONSES

PHOTO NOS.:	8, 9, 31, 35	6, 10, 22, 34	13, 30, 33, 36	5, 7, 26, 29	14, 17, 20, 32	11, 18, 21, 27	16, 19, 23, 28	12, 15, 24, 25
CATEGORY:	Interest-Excitement	Enjoyment-Joy	Surprise-Startle	Distress-Anguish	Disgust-Contempt	Anger-Rage	Shame-Humiliation	Fear-Terror
	attentive	amusement	amazed	about to cry	aversion	aggressive	ashamed	afraid
	attending	bliss	amused surprise	anguish	contempt	anger	bashful	anxious
	attracted	clowning	astonished	bad news	cynical	angry	embarrassment	apprehension
	concentrating	contentment	astonishment	crying	derision	bitterness	guilt	fear
	concentration	delight	fearful astonishment	dejected	disapproval	enmity	guilty	fright
	concern	delighted	joyful surprise	dejection	disdain	enraged	penitent	horror
	contemplation	ecstasy	pleasant astonishment	depression	disdainful	ferocity	repentance	panic
	curious	elation	pleasant surprise	despair	disgust	furious	shame	panicked
	curiosity	enjoyment	shock	disappointment	dislike	fury	shy	scared
	deliberating	gaiety	startle	distress	distaste	hostile	shyness	terrified
	excitement	glad	sudden reaction to something	feels like crying	insolence	mad	timidity	terror
	expectation	glee	unexpected surprise	grief	mockery	rage		
	fervor	gratitude	surprise, fear	hurt	repugnance	revenge		
	inquisitive	happiness	surprise, joy	loneliness	repulsion	spite		
	interest	humor	surprise with fear	melancholy	revulsion	vengeful		
	observation	jovial		misery	sarcasm	vexation		
	pensive	joy		not going well	scorn			
	pondering	joyful		pain	scornful			
	puzzlement	laugh		pathetic	skepticism			
	questioning	merry		pity	smirk			
	reflection	mystical ecstasy		sad	smug			
	religious fervor	optimism		sorrow	sneer			
	seriousness	playful		suffering	sneering			
	somber reflection	pleasantness		troubled	superiority			
	thoughtfulness	pleasure		uneasiness				
	wonder	rapture		unhappy				
		satisfaction		unloved				
		sees something pleasant		upset				
		self-satisfaction		worry				
		serenity						
		smile						

SCORING CRITERIA

	Score 1 Clear Cut	Score 2 Use your own judgment	Score 3 Clear cut	Score 4 Use your own judgment
SINGLE TERM RESPONSE WHICH EITHER STANDS ALONE OR IS THE FIRST IN A SERIES OF RESPONSES	1. The response is listed under the correct category.	1. The response is not listed under the correct category and it is not listed under one of the other 7 categories; but you consider it to be exclusively synonymous with the correct category.	1. The response is not listed under the correct category and it <u>is</u> listed under one of the other 7 categories. 2. The response is illegible. 3. There is no written response.	1. The response is not listed under any of the 8 categories and you consider it to be synonymous with an incorrect category. 2. The response is not listed under any of the 8 categories and you consider it to be synonymous with one or more categories, including the correct category.
PHRASE RESPONSE TERM EITHER STANDS ALONE OR IS THE FIRST IN A SERIES OF RESPONSES	1. The response is listed under the correct category. 2. The response includes terms which are listed under 2 or more categories, but the term belonging to the correct category is emphasized.	1. The response is not listed under the correct category, and you consider it to be <u>exclusively</u> synonymous with the correct category. 2. The response includes terms which are not listed under any of the 8 categories, and you consider the term which is emphasized to be <u>exclusively</u> synonymous with the correct category.	1. The response is not listed under the correct category, and it is listed under one of the 7 categories. 2. The response is a description of a possible eliciting circumstance for a feeling or a facial behavior. 3. The response includes terms which are listed under 2 or more categories, and either the term listed under the incorrect category is emphasized or none of the terms are emphasized. 4. The response is illegible.	1. The response is not listed under any of the 8 categories and you consider it to be synonymous with an incorrect category. 2. The response is not listed under any of the 8 categories and you consider it to be synonymous with one or more categories, including the correct category. 3. The response includes one or more terms, and you consider the term which is emphasized to be synonymous with an incorrect category.
BLEND WHICH EITHER STANDS ALONE OR IS THE FIRST IN A SERIES OF RESPONSES	1. The response is listed under the correct category.	1. A response includes a word which is listed under the correct category, and this word is combined with or modified by a word(s) which you do not consider contrary to its meaning. 2. The response is not listed under the correct category, and you consider it to be <u>exclusively</u> synonymous with the correct category.		1. A response includes a word which is listed under the correct category, and this word is combined with/ modified by a word(s) which you <u>do</u> consider contrary to its meaning.

APPENDIX C

FACTOR ANALYSIS CHARTS

Varimax Rotated Factor Matrix
Setting the Number of Factors to Eight
for the Emotion Recognition Test

Emotion Category & Photo No.	Factors							
	1	2	3	4	5	6	7	8
IE8	.07	.09	.73	-.01	.06	.12	.37	.20
IE9	.22	-.07	-.01	.14	.03	-.20	.64	.29
IE31	-.18	.07	.78	.09	.06	-.12	.02	.01
IE35	.20	-.01	.80	.07	-.03	.06	-.05	-.12
EJ6	.54	.36	.07	.04	.16	.23	-.07	.19
EJ10	.80	.21	.12	.13	.00	.08	.12	-.05
EJ22	-.13	-.20	.08	.44	.11	-.03	.21	-.05
EJ34	-.17	-.05	.39	.48	.00	.04	-.09	.49
SS13	-.05	.50	-.16	.24	.42	-.03	.05	.35
SS30	.32	.10	-.05	.72	.09	.04	-.07	.01
SS33	.21	-.10	.12	.18	.20	.11	-.51	.39
SS36	.32	.09	.03	.08	.01	.22	.01	.56
DA5	.29	-.35	.32	-.11	.36	-.06	.27	.17
DA7	.08	.43	.31	.53	.08	-.11	-.13	-.16
DA26	.13	.02	.09	.33	.13	.27	.40	-.08
DA29	-.31	.09	.21	.17	.02	.28	.63	-.04
DC14	-.49	.32	.11	-.01	-.07	.28	.31	.03
DC17	-.10	.16	.25	.20	.56	-.14	.28	.02
DC20	-.16	.07	-.11	.06	.06	.73	-.02	.06
DC32	-.42	.19	.29	.12	.35	.25	-.05	.16
AR11	.06	.02	.24	.60	.03	.20	.13	.17
AR18	.30	.14	.04	.15	.06	.75	-.04	.19
AR21	.06	-.03	.22	.07	.43	.51	.35	-.14
AR27	-.07	-.21	-.16	.73	.06	.13	.16	.03
SH16	-.10	.07	-.07	-.17	.63	.01	-.12	-.01
SH19	-.02	.40	.05	.26	.52	.03	.32	.05
SH23	.18	-.11	-.01	.23	.61	.27	-.09	-.05
SH28	.15	-.15	.02	.12	.71	.10	.03	.19
FT12	.18	.48	.14	.39	.10	-.07	.44	.19
FT15	.03	.66	.14	-.08	-.01	.31	.08	-.05
FT24	.12	.64	-.01	-.23	-.06	-.01	-.01	.02
FT25	-.14	.01	-.05	-.09	.09	-.01	.08	.77

Emotion

Varimax Rotated Factor Matrix
Setting the Number of Factors to Eight
for the Emotion Labeling Test

Emotion Category& Photo No.	Factors							
	1	2	3	4	5	6	7	8
IE8	.32	-.25	.02	.53	.18	.08	-.20	.21
IE9	.17	-.21	.65	-.02	.13	.09	-.00	.08
IE31	.14	-.03	.49	.34	-.06	.08	.07	.18
IE35	.24	-.52	-.10	.13	-.02	.11	.26	.15
EJ6	.20	-.10	.11	-.19	-.12	.64	.01	-.17
EJ10	.18	.29	-.13	-.09	-.24	.61	-.06	.30
EJ22	.65	.10	.13	-.15	.18	.00	.01	-.16
EJ34	-.12	-.01	.07	.12	.21	.83	.17	-.05
SS13	.73	-.01	.14	.03	-.06	.09	-.09	.06
SS30	.82	.03	.01	.02	-.15	.08	.00	-.06
SS33	.08	.26	-.01	-.12	-.41	.17	.03	.27
SS36	.11	.51	.01	.14	-.16	.37	-.14	-.11
DA5	-.07	.05	-.05	.17	.18	.17	-.80	.15
DA7	.17	.08	.14	-.21	.42	.13	.04	-.05
DA26	.07	.70	.08	.09	.13	-.13	.18	.05
DA29	.30	.24	.15	-.07	-.32	-.11	.18	.32
DC14	-.14	-.12	.15	.20	.03	-.17	.07	.66
DC17	-.07	-.08	.06	.75	-.09	-.10	-.02	-.14
DC20	-.19	-.29	.03	.47	-.35	.00	.12	.14
DC32	.04	.13	.46	.40	-.03	.19	.21	-.22
AR11	.08	.57	-.19	-.18	.06	.23	.07	.14
AR18	-.15	.26	.53	-.25	-.21	-.20	.10	.19
AR21	.17	.16	.65	.10	-.08	-.01	-.07	-.05
AR27	.24	.36	.41	-.17	-.27	.10	-.06	-.09
SH16	.04	-.04	-.03	.11	.03	-.06	.05	-.77
SH19	.34	.30	-.52	.19	-.04	.09	-.04	.17
SH23	-.19	.10	-.09	-.10	.55	.01	-.07	-.01
SH28	-.02	-.14	-.12	-.12	.65	-.14	.13	.32
FT12	.16	.48	.10	.15	.56	-.03	-.01	-.09
FT15	-.24	-.11	.03	.12	.04	.19	.61	.00
FT24	.05	.28	-.01	.18	.16	.12	.73	.23
FT25	-.06	.26	-.04	.59	-.12	-.04	.13	.02

Varimax Rotated Factor Matrix

Yielding 12 Factors with a Minimum Eigen Value at 1.00
For the Emotion Recognition Test

Factors

Emotion Category & Photo No.	1	2	3	4	5	6	7	8	9	10	11	12
IE8	.11	.13	.74	-.07	.07	.16	.34	.10	.16	.12	.05	.08
IE9	.20	-.17	.02	.16	.01	-.03	.77	.13	.14	-.03	.20	.02
IE31	-.12	.04	.78	.08	.03	.25	.01	-.01	-.01	.03	-.16	-.05
IE35	.08	.04	.85	.08	.01	.12	-.09	-.08	-.05	-.03	.07	.11
EJ6	.88	.01	.02	.05	.05	.11	.08	.01	.01	.07	.14	-.17
EJ10	.74	.20	.10	.14	.02	-.24	.08	-.13	-.09	.04	-.04	-.30
EJ22	.05	-.07	.00	.09	.10	.14	.03	.03	.02	.85	-.13	.07
EJ34	-.05	-.23	.37	.43	-.07	.23	.00	.47	.04	.11	-.12	.16
SS13	.13	.34	-.15	.32	.37	.16	.24	.23	.01	.02	.04	.54
SS30	.22	.01	.01	.77	.15	-.03	-.03	-.13	.20	.09	-.02	.12
SS33	.44	-.23	-.05	-.13	.16	.17	.46	.26	.22	.08	.00	-.10
SS36	.19	.15	.11	.16	.14	.00	.07	.20	.76	.00	.05	-.04
DA5	.17	.24	.34	-.19	.39	-.33	.26	-.33	.19	.05	.05	.12
DA7	.23	.19	.30	.61	.02	.05	.06	.04	-.43	-.05	.02	-.18
DA26	.04	.13	.09	.29	.14	.09	-.18	.08	.06	.07	.22	.74
DA29	-.15	.10	.17	.02	-.04	.33	.54	-.01	.13	.30	.28	.14
DC14	-.19	.20	.06	-.03	-.17	.56	.34	.09	.02	.00	.23	-.11
DC17	.23	.06	.12	.06	.37	.40	.18	.23	.48	.21	-.16	.20
DC20	-.06	.03	-.08	.10	.08	.12	-.03	.12	-.10	-.19	.82	.12
DC32	.08	-.01	.15	.02	.17	.82	-.09	.11	.04	.07	.09	.05
AR11	.05	.07	.25	.43	.08	-.10	.08	.19	-.01	.54	.27	.09
AR18	.44	.13	.02	.08	.09	.06	-.06	.04	.22	.15	.67	.07
AR21	.20	-.09	.21	-.05	.42	.23	.42	.33	.03	.17	.41	.10
AR27	-.16	-.27	.09	.70	.11	.06	.17	.00	.08	.14	.16	.20
SH16	-.20	.07	.02	.02	.66	.03	.04	.04	-.06	-.43	.05	-.07
SH19	.13	.34	.02	.25	.45	.34	-.28	.06	.10	.10	-.04	.09
SH23	.03	.02	.04	.16	.72	-.16	.12	-.03	.01	.22	-.27	-.01
SH28	.16	-.12	.01	.07	.73	.19	.02	.07	.23	.11	-.06	.10
FT12	.10	.51	.18	.44	.11	-.06	.39	.28	.07	.11	.00	.14
FT15	.09	.72	.14	-.05	.01	.07	.02	.07	.01	.08	.29	-.14
FT24	.08	.74	-.01	-.09	-.05	.05	-.11	-.04	.11	.16	-.09	.12
FT25	-.05	.07	-.06	.09	.07	.05	.04	.87	.13	-.01	.08	.02

Varimax Rotated Factor Matrix

Yielding 14 Factors with a Minimum Eigen Value at 1.00

For the Emotion Labeling Test

Factors

Category & Emotion Photo No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IE8	.21	.03	-.17	-.05	.07	.15	-.07	.00	-.12	.12	.76	.12	.07	-.09
IE9	.19	-.22	.25	-.31	.02	.07	.12	-.13	.02	.56	.19	-.03	-.07	-.35
IE31	.09	.02	.01	-.08	.04	.14	.04	-.10	.07	.78	.08	.03	.14	-.06
IE35	.08	-.12	-.08	-.10	.01	.07	.07	.01	.09	.04	.08	.90	.00	-.02
EJ6	.19	.11	-.03	.07	.79	-.17	.03	.26	.05	-.03	.07	-.14	-.17	-.02
EJ10	.24	-.05	.20	.47	.49	.27	-.01	-.10	.28	-.09	-.17	-.05	-.10	-.10
EJ22	.74	.21	.11	-.01	.04	-.09	-.01	-.02	-.08	-.02	-.03	-.07	-.11	-.07
EJ34	-.14	.16	.05	.10	.80	.04	.12	.16	.05	.16	.03	.15	.06	.14
SS13	.77	-.15	.09	.12	.00	.00	.01	-.01	.03	.25	.25	.00	-.12	-.09
SS30	.78	.03	-.04	.07	-.03	-.12	.11	.17	-.25	.00	.01	.21	-.12	-.14
SS33	.10	-.11	.09	-.05	.12	.09	-.02	.06	.83	-.07	-.04	-.08	.00	-.05
SS36	-.04	.07	.06	.49	.15	-.29	-.19	.03	.32	.49	-.02	.02	-.08	-.07
DA5	-.04	.01	.03	.13	.09	.17	.69	-.37	-.04	-.01	.32	-.15	.02	.02
DA7	.07	.17	.03	.05	.05	.05	.00	.04	-.03	-.01	-.08	-.02	-.01	.87
DA26	.00	.37	-.04	.27	.26	.08	.20	.06	.42	.40	.03	-.33	-.13	.08
DA29	.10	-.16	.01	-.02	.02	.21	.03	.74	.33	.15	.13	.01	.11	.14
DC14	-.18	.11	.08	-.13	-.10	.10	.01	.16	.16	-.01	.14	.16	.14	-.10
DC17	-.14	.13	-.08	.11	-.11	-.14	-.04	.08	.19	.04	.36	.04	.74	-.12
DC20	-.02	.32	-.03	-.02	.00	.21	.14	-.04	-.19	.07	.07	-.06	.72	-.18
DC32	.01	.33	.29	.02	.20	-.15	.01	.13	-.17	.46	.20	-.19	.47	.03
AR11	.00	.16	.26	.73	.05	.12	.13	-.02	-.06	-.08	.00	-.05	-.30	.05
AR18	.04	.01	.65	-.13	-.15	.26	.14	-.03	.01	-.13	-.27	-.23	-.05	-.21
AR21	.09	.24	.50	.25	.17	.00	-.03	.42	-.06	.11	.32	.23	.01	-.07
AR27	.22	.04	.74	.18	-.01	-.08	-.08	.07	.09	.03	-.07	.05	-.02	.14
SH16	.09	.21	.01	-.15	.05	-.71	.02	-.03	-.24	.12	.05	.02	.09	-.20
SH19	.25	.03	-.30	.68	-.04	-.18	-.03	-.15	-.08	.11	.03	.14	.18	.07
SH23	.00	.37	.19	.23	.01	.02	-.03	-.67	.19	.02	-.09	-.03	-.24	-.08
SH28	.10	.34	-.49	.17	-.01	.48	.06	-.13	-.31	.01	-.26	-.14	-.10	.06
FT12	.11	.78	.06	.13	.02	-.01	-.05	-.04	-.12	.02	.10	-.14	-.07	.13
FT15	-.09	-.17	.02	.02	.17	.04	.82	-.20	-.10	.06	.12	.14	.09	-.06
FT24	-.03	.44	.07	.16	.05	.18	.64	.03	.22	.01	.03	.32	.04	-.06
FT25	-.04	.27	.11	.09	-.07	.08	.24	-.11	.23	-.02	.44	-.01	.30	-.41

APPENDIX D

CELL MEANS AND STANDARD DEVIATIONS

AND

CHI-SQUARE TABLES

Cell Means and Standard Deviations for Emotion Recognition Test

Group	Sex		I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
1	M	Mean	3.1	3.8	3.6	3.1	2.5	3.0	2.4	2.4
		S.D.	.99	.63	.97	.88	1.51	1.25	1.17	.84
	F	Mean	3.0	4.0	3.5	3.3	2.8	3.4	3.2	2.6
		S.D.	.94	.00	.71	.67	1.32	.97	.92	.84
2	M	Mean	3.2	3.9	2.8	2.2	2.0	3.1	1.8	2.3
		S.D.	1.03	.32	1.14	1.03	1.25	1.29	1.81	1.25
	F	Mean	3.0	3.9	3.3	2.7	2.9	3.6	2.7	2.7
		S.D.	1.25	.32	1.06	.82	.88	.52	1.16	.95
3	M	Mean	2.1	3.6	2.7	1.6	1.6	2.6	1.4	1.9
		S.D.	1.60	.70	1.42	1.43	.97	.84	1.26	1.73
	F	Mean	2.9	3.4	2.8	1.9	2.1	2.2	1.8	1.9
		S.D.	1.20	.70	.63	.88	1.10	1.23	.92	.99

Group 1 - 18-35; Group 2 - 35-60; Group 3 - 60+

Cell Means and Standard Deviations for Emotion Labeling Test

Group	Sex		I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
1	M	Mean	1.2	3.7	2.7	2.2	1.1	3.2	.6	1.8
		S.D.	1.23	.67	1.34	1.03	1.37	.79	.70	.79
	F	Mean	1.5	3.7	3.4	2.6	1.6	2.7	.8	2.0
		S.D.	1.51	.67	1.26	.84	1.43	1.16	.63	1.05
2	M	Mean	1.8	3.5	3.0	1.8	2.0	2.8	.8	2.3
		S.D.	.79	.97	1.05	.63	1.05	1.14	.92	1.25
	F	Mean	2.4	3.3	3.1	2.3	1.7	3.0	.9	1.7
		S.D.	.84	.82	.74	.95	1.16	1.15	.57	1.25
3	M	Mean	1.6	3.9	2.9	1.5	.9	2.6	.2	1.3
		S.D.	1.26	.32	.88	.71	.99	.84	.63	1.42
	F	Mean	1.9	2.9	2.2	1.4	1.5	1.9	.5	1.6
		S.D.	1.45	1.20	1.14	.97	1.08	1.20	.71	1.35

Group1 - 18-35; Group 2 - 35-60; Group 3 - 60+

Combined Group Means for Emotion Labeling Test

Group	I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
1	1.35	3.70	3.05	2.40	1.35	2.95	.70	1.90
2	2.10	3.40	3.05	2.05	1.85	2.90	.85	2.00
3	1.75	3.40	2.55	1.45	1.20	2.25	.35	1.45

Combined Group Means for Emotion Recognition Test

Group	I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
1	3.05	3.90	3.55	3.20	2.65	3.20	2.80	2.50
2	3.10	3.90	3.05	2.45	2.45	3.35	2.25	2.50
3	2.50	3.50	2.75	1.75	1.85	2.40	1.60	2.40

Group 1 - 18-35; Group 2 - 35-60; Group 3 - 60+

Contingency Table for Distribution of
Responses to Ten Questions on the EAQ

Question	Group	I-E	E-J	S-S	D-A	D-C	A-R	S-H	F-T
1	1	16	3	0	1	0	0	0	0
	2	17	2	0	0	0	1	0	0
	3	15	2	1	1	0	1	0	0
	Totals	48	7	1	2	0	2	0	0
2	1	0	0	0	0	3	7	3	7
	2	0	0	3	1	0	5	2	9
	3	0	2	3	2	3	3	1	6
	Totals	0	2	6	3	6	15	2	22
3	1	0	0	0	5	0	6	3	6
	2	0	0	0	2	0	5	7	6
	3	0	0	1	1	3	3	5	7
	Totals	0	0	1	8	3	14	15	19
4	1	0	0	0	7	3	1	4	5
	2	0	0	0	0	4	3	3	10
	3	0	1	0	5	2	6	4	2
	Totals	0	1	0	12	9	10	11	17
5	1	5	15	0	0	0	0	0	0
	2	3	17	0	0	0	0	0	0
	3	6	12	0	1	0	0	1	0
	Totals	14	44	0	1	0	0	1	0
6	1	13	5	2	0	0	0	0	0
	2	15	3	2	0	0	0	0	0
	3	12	7	1	0	0	0	0	0
	Totals	40	15	5	0	0	0	0	0
7	1	9	11	0	0	0	0	0	0
	2	17	3	0	0	0	0	0	0
	3	15	3	2	0	0	0	0	0
	Totals	41	17	2	0	0	0	0	0
8	1	1	0	0	0	0	6	3	10
	2	0	1	0	2	1	4	1	10
	3	2	2	0	1	0	5	1	9
	Totals	3	3	0	3	1	15	5	29
9	1	0	1	2	16	1	0	0	0
	2	0	0	8	12	0	0	0	0
	3	0	0	11	8	1	0	0	0
	Totals	0	1	21	36	2	0	0	0
10	1	0	0	3	15	2	0	0	0
	2	0	0	11	9	0	0	0	0
	3	0	1	13	6	0	0	0	0
	Totals	0	1	27	30	2	0	0	0

Inter-Item Correlations for the Emotion Labeling Test

	IE8	IE9	IE31	IE35	EJ6	EJ10	EJ22	EJ34	SS13	SS30	SS33	SS36	DA5	DA7	DA26	DA29	DC14	DC17	DC20	DC32	AR11	AR18	AR21	AR27	SH16	SH19	SH23	SH28	FT12	FT15	FT24	FT25
IE8	1.00																															
IE9	.10	1.00																														
IE31	.26	.40	1.00																													
IE35	.23	.05	.04	1.00																												
EJ6	.09	.06	.00	-.07	1.00																											
EJ10	-.02	-.10	-.03	-.03	.26	1.00																										
EJ22	.13	.15	.02	-.01	.18	.14	1.00																									
EJ34	.02	.08	.09	.13	.43	.34	-.07	1.00																								
SS13	.23	.30	.18	.10	.16	.19	.39	-.04	1.00																							
SS30	.11	.09	.04	.14	.19	.22	.42	-.02	.60	1.00																						
SS33	-.13	.01	-.09	-.09	.19	.29	.04	.03	.70	.20	1.00																					
SS36	-.05	.01	.11	-.09	.15	.29	.04	.25	.16	.20	.08	1.00																				
DA5	.25	-.03	-.04	-.13	-.08	.10	-.06	.05	.08	-.05	.00	.08	1.00																			
DA7	-.05	.19	-.04	-.06	.01	.02	.14	.16	-.01	.14	-.07	.00	-.03	1.00																		
DA26	-.10	-.03	-.11	-.29	-.11	-.02	.06	-.05	.07	.05	.21	.43	-.12	.10	1.00																	
DA29	.02	-.06	.18	-.02	.15	.12	.04	-.07	.20	.20	.29	.15	-.21	.10	.21	1.00																
DC14	.08	.05	.04	-.16	-.02	.06	-.02	-.08	-.12	-.07	.01	-.16	.01	-.01	-.06	-.08	1.00															
DC17	.30	.03	.10	.04	-.12	.07	-.10	-.15	.08	-.01	-.05	.03	.08	-.01	-.01	-.15	.12	1.00														
DC20	.08	-.01	.17	.06	-.07	.05	.15	-.03	-.17	-.03	-.02	.01	-.20	-.16	.01	-.20	.20	.12	1.00													
DC32	-.05	.13	.37	.12	.07	.05	.31	.10	.03	.10	-.08	.22	.05	.24	.10	.05	.04	.35	.24	1.00												
AR11	-.08	-.15	.07	-.16	.01	.34	.06	.08	.13	.06	.25	.01	-.16	.13	.21	.00	.01	-.28	-.24	-.01	1.00											
AR18	-.18	.16	.07	-.19	-.17	.13	.07	.08	-.12	.07	.01	.16	.03	-.05	.13	.16	.17	-.15	.03	.11	.10	1.00										
AR21	.15	.23	.13	-.16	.22	-.05	.18	.14	.06	.18	.03	.24	-.02	.02	.12	.24	.19	.15	-.09	.26	.15	.27	1.00									
AR27	-.12	.15	.09	-.07	.08	.26	.16	.01	.18	.16	.15	.15	.05	.11	.08	.15	.08	-.19	-.07	.17	.23	.34	.32	1.00								
SH16	-.04	-.12	-.10	-.01	.08	-.19	.09	.04	.00	.10	.02	.02	-.08	-.10	-.16	-.10	-.16	.15	.10	.16	.00	-.07	.09	-.04	1.00							
SH19	.03	-.24	-.11	-.13	.01	.19	.14	.05	.17	.23	.22	.05	.05	.17	.00	.09	.00	.30	.01	-.02	.01	-.28	-.12	.01	.10	1.00						
SH23	.01	-.03	-.10	-.06	-.12	-.08	.08	.08	.02	-.10	.15	.02	-.15	.17	.29	-.13	.17	-.06	-.21	-.15	-.06	-.02	-.17	-.12	.09	-.17	1.00					
SH28	.01	-.03	.05	-.06	-.12	.04	.04	.08	-.09	-.09	-.01	-.29	.01	.15	.01	.02	.25	-.13	-.06	-.02	-.15	-.06	-.02	-.17	-.33	-.11	-.01	.30	1.00			
FT12	.03	-.07	.07	-.19	.00	.26	.07	.03	.00	.06	.03	.02	.22	.15	.30	.02	.05	-.03	-.26	.23	.23	.17	.10	.06	.16	.16	.23	-.08	1.00			
FT15	.05	.09	.00	.06	.00	-.04	-.09	.23	.01	-.04	-.11	-.22	.15	.07	.07	.19	.00	.00	.09	.01	.06	-.02	.03	-.15	-.01	.03	.06	.09	.16	1.00		
FT24	-.01	.00	.11	.20	-.07	.13	-.01	.24	.12	-.02	-.02	.06	-.02	.11	.27	.13	.19	.00	.25	.10	.25	.03	.05	.11	-.10	.05	.11	-.10	.24	.38	1.00	
FT25	.23	.09	-.06	-.09	-.07	-.05	.06	.06	.03	.09	-.05	-.03	.10	-.05	.12	.12	.04	.12	.02	.11	-.02	.05	.00	.03	.09	.02	.03	.09	-.17	.14	.26	1.00

APPENDIX E

32 X 32 INTER-ITEM CORRELATION CHARTS

Inter-Item Correlations for the Emotion Labeling Test

	IE8	IE9	IE31	IE35	EJ6	EJ10	EJ22	EJ34	SS13	SS30	SS33	SS36	DA5	DA7	DA26	DA29	DC14	DC17	DC20	DC32	AR11	AR18	AR21	AR27	SH16	SH19	SH23	SH28	FT12	FT15	FT24	FT25
IE8	1.00																															
IE9	.10	1.00																														
IE31	.26	.40	1.00																													
IE35	.23	.05	.04	1.00																												
EJ6	.09	.06	.00	-.07	1.00																											
EJ10	-.02	-.10	-.03	-.03	.26	1.00																										
EJ22	.13	.15	.02	-.01	.18	.14	1.00																									
EJ34	.02	.08	.09	.13	.43	.34	-.07	1.00																								
SS13	.23	.30	.18	.10	.16	.19	.39	-.04	1.00																							
SS30	.11	.09	.04	.14	.19	.22	.42	-.02	.60	1.00																						
SS33	-.13	-.13	.04	-.09	.19	.29	.04	.03	.70	.20	1.00																					
SS36	-.05	.01	.11	-.09	.15	.29	.04	.25	.16	.20	.08	1.00																				
DA5	.25	-.03	-.04	-.13	-.08	.10	-.06	.05	-.05	-.08	.00	.08	1.00																			
DA7	-.05	.19	-.04	-.06	.01	.02	.14	.16	.14	-.01	-.03	.00	-.03	1.00																		
DA26	-.10	.03	.11	-.29	-.11	-.02	.06	-.05	-.05	.05	.21	.43	-.12	.10	1.00																	
DA29	.02	-.06	.18	-.02	.15	.12	.04	-.07	.07	.20	.29	.15	-.21	.10	.21	1.00																
DC14	.08	.05	.20	-.17	-.02	-.20	-.08	-.07	-.12	-.02	-.16	.01	-.06	-.08	.12	.01	1.00															
DC17	.30	.03	.10	.04	-.21	-.12	.08	-.15	.04	-.05	.03	.01	-.01	.01	-.05	.17	.12	1.00														
DC20	.08	-.01	.17	.06	-.07	-.20	-.08	-.17	-.03	-.03	-.02	.01	-.20	.01	-.16	.19	-.05	.35	1.00													
DC32	-.05	.13	.37	.12	.07	.12	.04	.03	-.10	.10	-.08	-.21	.05	-.10	.10	.07	.10	.24	.26	1.00												
AR11	-.08	-.15	.07	-.16	.01	.34	.13	.06	.06	.07	.05	.25	.01	.13	.21	.00	.01	.17	.01	.01	1.00											
AR18	-.18	.16	.07	-.19	-.17	.13	.08	-.12	.07	-.10	.13	.01	-.10	-.05	.13	.16	.17	-.01	.16	-.05	-.01	1.00										
AR21	.15	.23	.13	-.16	.22	.14	-.05	.06	.18	.15	-.02	.03	.15	-.01	.12	.24	.19	.15	.26	.02	.11	.10	1.00									
AR27	-.12	.15	.09	-.07	.08	.26	.18	.01	.16	.31	.15	.01	.31	.11	.08	.15	-.17	-.10	.17	.15	-.02	.27	.34	1.00								
SH16	-.04	-.12	-.10	-.01	.08	-.19	.09	.00	.10	-.16	.02	.25	.02	-.08	-.10	-.16	.15	.09	.15	.13	-.16	-.06	-.07	-.04	1.00							
SH19	.03	-.24	-.11	-.13	.01	.19	.14	.05	.17	.23	.13	.01	.22	.05	.17	.00	.09	.01	-.02	.05	-.02	.30	-.12	.01	.10	1.00						
SH23	.01	-.03	-.10	-.06	-.03	-.08	.04	-.09	.02	.02	-.02	.15	.02	-.01	.29	-.06	-.06	-.21	-.15	-.13	-.15	-.06	-.17	.09	-.17	.30	1.00					
SH28	.01	-.03	.05	-.06	-.12	-.08	.08	-.01	.08	-.08	.01	-.29	.01	.15	-.01	.02	.25	.02	-.13	-.06	-.02	-.02	-.06	-.02	-.11	-.01	.30	1.00				
FT12	.03	-.07	.07	-.19	.00	.26	.07	.03	.06	.15	.02	.02	.30	.15	.02	.05	.23	-.03	-.26	-.06	.23	.01	.09	.17	.10	.06	.07	.16	1.00			
FT15	.05	.09	.05	.00	-.06	-.09	.23	.01	-.12	-.31	.07	.19	.00	-.11	.19	.00	.01	.00	.30	.09	.06	.09	-.02	-.15	-.07	-.01	-.10	.03	.16	1.00		
FT24	.01	-.01	.11	.20	.13	-.01	.24	-.07	-.24	.06	-.02	-.34	.08	.27	.19	.13	.04	.32	.12	.11	.25	.19	.13	.05	.11	.10	.01	.09	.09	.38	1.00	
FT25	.23	-.06	.06	-.09	-.07	-.07	.06	-.05	-.07	.09	.10	-.05	.12	.10	.08	.12	.04	.12	.04	-.02	.05	.03	.00	.09	.02	.03	.09	.02	-.17	.17	.14	.26	1.00

APPENDIX F

LABELING AND RECOGNITION RESPONSES

FOR SIGNIFICANT AGE GROUP DIFFERENCES

ON DISTRESS-ANGUISH CATEGORY

Distress-Anguish Labels Generated by
Subjects within the 18-35 Age Group

Item 5	Item 7	Item 26	Item 29
crying	concern	concerning	sadness
sad	terrified	disappointed	disgusted
sorrow	upset	unhappy	sad
distrust	anxiety	grief	disbelief
hurt	afraid	very sad	sad
restraining tears	disbelief	disappoint- ment	hope
frightened	upset	sadness	disappointment
sad	serious	sad	grieved
wondering look	hurt	upset	trying to re- main composed
preliminary to dis- agreea- bility	hurt	hurt due to bad news	sadness
frightened	she look unhappy	sad	very sad
a touch of anger or revenge- fulness	a feeling of hate or anger	a very upset attitude	an internal unhappiness
tearful	fear	abused	quiet joy
feelings hurt	angry	very sad or hurt	hurt
sadness	sadness	disappoint- ment	unhappiness
hurt	anger	sad	upset
sad	disillusioned	hurt	sad
on the verge of tears	emotional pain	pain	happy tears
scared	hope	pain	hurt
hesitant	grieving	upset	happy

Distress-Anguish Labels Generated by
Subjects within the 35-60 Age Group

Item 5	Item 7	Item 26	Item 29
uncertainty	fear	hurt	sadness
squeamish	anxious	pity	concern
sadness	concern	guilt-ridden	sad
unhappiness	misery	tearful distress	obviously unhappy
her feelings are hurt	anger	grief	she's meditating
pleasantly interested	intensified negative feelings	hurt	very sad
sorrow	concern	strong sympathy	doubt
fearful	unhappy	worried	sorrowful
curiosity mixed with mistrust of photographer	resentment	sadness	sadness but maybe only concentration
hurt feelings	suffering	sadness	amusement
amazement	sorrow	sorry	sorry
slight fear	shock	sadness	unhappiness
pondering	perplexed	sadness	disappointment
sad	ready to cry	concentration	disbelief
attentive	great sadness	great sadness	unhappiness
quizzical	sad	sad	sad
fear	fear	sorrowful	crying
mild fear	fear	sadness	grief
questioning	resentment	"do I have to do it?"	about to cry
uncertainty	anger	begging	surprised

Distress-Anguish Labels Generated by
Subjects within the 60+ Age Group

Item 5	Item 7	Item 26	Item 29
I don't know	fear	sorrow	dislike
girl wondering just what you mean	lady is somewhat baffled	intensity	surprise
puzzled	sadness	winsome	sleepy
disappointment	surprise	happy	acceptance
smiling	indecision	sorrowful	sorrow
incredulous interest	woe	sadness	sadness
I hear you but I doubt it	I'm scared	doubt	homely
questioning	disagreement	unhappy	sorrow
distrust	sad	disappointed	sorrow
amazement	consternation	uncertainty	broken-hearted
study	astonishment	sympathetic	disbelief
sad	in trouble	agreement	self-image
suspicion	amazement	compassion	sorrow
interest	attention	sorrowful	unbelievable sorrow
unhappy	sad	sympathetic	too tired to think
questioning	anger	injured feelings	hurt
disappointed	disappointed	surprised disappointment	pain
unbelief	sorrow	sympathy	dismay
unsure	pained	(illegible)	discouraged
some happiness	disbelief	agony	not sure of himself

Subject Correct and Incorrect Responses for

Emotion Recognition Test

Category	Item No.	18-35								35-60								60+							
		IE	EJ	SS	DA	DC	AR	SH	FT	IE	EJ	SS	DA	DC	AR	SH	FT	IE	EJ	SS	DA	DC	AR	SH	FT
IE	8	15	2			7			1	14	3						1	10	1	3	1	1	1		4
	9	12							1	14								12	4	1					
	34	19					2			17	2		2					15	2	1	1	1	1		2
	35	15	1	2						15	2		1				1	13	1	2	2	1			2
EJ	6		19		1						20							1	18						
	10		20								20								19						
	22		20			1					20								16	2		1			
	34		19		1			1		1	18							2	17	1					
SS	13	1	19		1	1			2		1		10	1		3		4	1	15	4				
	30		20		16					1	1		11	1		2			3	17	8				
	33	2	17		19		2			4	1		15	1	1			4	2	8	1	1	1		
	36	2	15		15				1	2	14		13	7			1	2	15	1	1	1		5
DA	5	1	1		14	1			2	3			10	1			3	2	3	4	8	3	2	1	1
	7				16								11	2		2	1	2	4	8	12	6	1	1	
	26	1			19		1		2				15	1	1		1	1		12	11	1	1	3	3
	29	1			15	1							13	7		1	1	1		11		1			5
DC	14	1	1		4	11		18	3	1			14				3	3	1		3	12	7	2	
	17				16	14		15					9	2	2			1	1	1	6	2	16	4	
	20			3	14	14	1	12					16	1	1					1	12	15	1	2	
	32	1			4	14	2	19	1	1	1		10	1	2	2					11	8	1	2	
AR	11					1		18					1		1	1				1	1	7	12		
	18							15					17		1	1					4	3	16	6	2
	21				3			12					14		2							3	7		
	27						1	19		1			18					1		1		6	14	2	
SH	16	5					4	13	1	3	1			14		14		3	1	2	1	4	1	1	1
	19	1						19		3				14		14		4		3	1	1	1	1	1
	23	2	1		4			14		4	1	5		8		8				2	1	8	7		
	28	8			1			10		8				9		9		12		2	1	1		3	
FT	12	1		13					20		1		1				18	3	3	3	3	1	1	1	14
	15			8					7		9						8	4	4	4	4	1	1	4	10
	24			4					11		6	2					13	2	2	2	2	2	1	2	11
	25			3					12		3		1				11	2	1	1		3	3	7	13