

## INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.
2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in "sectioning" the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.

University  
Microfilms  
International

300 N. ZEEB ROAD, ANN ARBOR, MI 48106  
18 BEDFORD ROW, LONDON WC1R 4EJ, ENGLAND

7908826

GUTHRIE, PERRY THOMAS  
PERCEPTION OF EMOTIONS AND ATTRIBUTION OF  
ACCEPTANCE BY NORMAL AND EMOTIONALLY  
DISTURBED SUBJECTS.

THE UNIVERSITY OF OKLAHOMA, PH.D., 1978

University  
Microfilms  
International

300 N. ZEEB ROAD, ANN ARBOR, MI 48106

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

PERCEPTION OF EMOTIONS AND ATTRIBUTION OF ACCEPTANCE

BY NORMAL AND EMOTIONALLY DISTURBED SUBJECTS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

PERRY THOMAS GUTHRIE

Norman, Oklahoma

1978

PERCEPTION OF EMOTIONS AND ATTRIBUTION OF ACCEPTANCE

BY NORMAL AND EMOTIONALLY DISTURBED SUBJECTS

APPROVED BY

Robert H. Ingram  
George L. Satchworth  
R. E. Roalson  
Arslan Sderman

### Abstract

The possible influence of the variable psychopathology affecting the perception of facial cues of emotion was investigated. In addition, age as a significant variable affecting perception of facial cues was assessed. This study also investigated if a difference in perception existed among subjects in terms of attribution of acceptance. The experimental data was analyzed using an analysis of variance, repeated measures design. The hypothesis concerning age was significant,  $F(1, 32) = 10.23, p < .01$ , with the adolescent group being more accurate in their perception of emotions than the latency age group. The two remaining hypotheses were not found to be significant.

## TABLE OF CONTENTS

|  | Page |
|--|------|
| LIST OF TABLES . . . . .   | v    |
| Manuscript to be submitted for publication   |      |
| INTRODUCTION. . . . .  | 1    |
| METHOD. . . . .  | 4    |
| RESULTS . . . . .  | 5    |
| DISCUSSION. . . . .  | 6    |
| REFERENCE NOTES . . . . .  | 13   |
| REFERENCES . . . . .   | 14   |
| APPENDIX A. Prospectus. . . . .  | 18   |
| APPENDIX B. Research proposal to committee<br>for human research. . . . .          | 50   |
| APPENDIX C. Parental permission form and<br>research project description . . . . . | 57   |
| APPENDIX D. Pictures of facial affect . . . . .                                    | 60   |
| APPENDIX E. List of pictures of facial<br>affect slides used. . . . .              | 65   |
| APPENDIX F. Likert type scale<br>for perception of emotion . . . . .               | 68   |
| APPENDIX G. Likert type scale<br>for attribution of acceptance . . . . .           | 71   |

## LIST OF TABLES

| TABLE  | Page |
|--|------|
| 1. Repeated Measures Analysis of Variance<br>of Accuracy of Perception of Emotions . . . . .   |      |
| 2. Means and Standard Deviations of Accuracy<br>of Perception of Emotion for Emotion . . . . . |      |
| 3. Repeated Measures Analysis of Variance<br>of Attribution of Acceptance. . . . .             |      |

## Acknowledgements

I am most appreciative of the guidance and direction that my major professor, Dr. Albert D. Smouse, has provided throughout my graduate study and the preparation of this dissertation. I am also appreciative of the assistance and training provided by my committee members, Dr. George Letchworth, Dr. Avi Sherman, and Dr. Robert Ragland.

I would like to express my gratitude to Dr. Robert Clapp and the professional staff at Children's Medical Center, Tulsa, Oklahoma, for their invaluable help in this study. Also, to the children at Children's Medical Center, without which there would be no study, I am deeply grateful. The interactions with them throughout the year were very meaningful.

A special appreciation goes to Ellen Maschal, whose friendship and support was continuous throughout the research project.

This dissertation is dedicated to my parents, Marvin and Dollie Guthrie, who encouraged me to pursue my degree. I express my appreciation, gratitude, and love.



PERCEPTION OF EMOTIONS AND ATTRIBUTION OF ACCEPTANCE  
BY NORMAL AND EMOTIONALLY DISTURBED SUBJECTS

INTRODUCTION

When two people are involved in a communication process, it is not uncommon for the addressee to misperceive the information that he is receiving. The misperception may be due to unclear verbal content of the message, incongruent nonverbal gestures, extreme psychological stress, or use of defense mechanisms.

It has been argued that while the verbal component of a statement conveys cognitive information, the nonverbal components (e.g. facial expression, gesture, vocal quality) convey information pertaining to the psychological state of the communicator, such as his attitudes and feelings about the situation, the topic of conversation, the addressee and himself (Davitz, 1964; Fairbanks & Provost, 1939; Moses, 1954). Information conveyed by nonverbal cues appears to be less affected by conscious control than the verbal aspects of a communication (Ekman, 1964; Moses, 1954). The nonverbal cues are, therefore, viewed as a major source of information pertaining to unmonitored intentions, perceptions and affective state of the communicator.

Research in facial communication has been in two major areas: encoding and decoding of cues. Recent reviews of the literature have indicated that accuracy in encoding and decoding facial cues by judges

occurs with a degree of agreement far greater than chance (Davitz, 1964; Ekman, Friesen & Ellsworth, 1972; Frijda, 1969; Izard, 1971), although individuals vary markedly in their decoding skills (Rosenthal, Archer, Koivumaki, DiMatteo & Rogers, Note 3). Studies in social psychology on the recognizability of emotional expression are inconclusive, ranging from chance performance in decoding skills (Jarden & Fernberger, 1926; Sherman, 1927; Fernberger, 1927, 1928; Guilford, 1929, Landis, 1929) to considerable accuracy in labelling emotional expression (Schulze, 1912; Feleky, 1914; Langfeld, 1918; Ruckmick, 1921; Stratton, 1921; Goodenough, 1931; Woodworth, 1938; Munn, 1940; Darwin, 1965). Bruner and Taguiri (1954) conclude that innate capacity affects only the recognition of the grossest forms of emotional expression whereas finer discriminative abilities develop primarily due to the individual's social experiences. In addition, several studies have suggested that nonverbal expression may become inhibited in the process of socialization (Jones, 1960; Lanzetta & Kleck, 1970; Izard, 1971).

One area of nonverbal communication research is the evaluation of facial cues by various emotionally disturbed populations. Only a few studies have been reported and the results have been conflicting. Although no support was found for a hypothesized relationship between incongruity of verbal and nonverbal information and the degree of pathology, Beakel and Mehrabian's (1969) study indicated a relationship between the amount of negative attitude in parental messages and the degree of psychopathology of the adolescent within the family. Wiig and Harris (1974) found evidence to suggest that learning disabled adolescents misinterpret stimuli previously judged as being relatively

positive as being relatively negative. Kaufman (1969) found that emotionally disturbed preadolescent boys tended to express more extreme and more positive perceptions of family and school related variables, their response tendencies suggesting the operation of dynamic defense mechanisms. In Beakel's (1970) study of parental messages, results were interpreted as reflecting a characteristic style of communication which affect the child's behavior through modeling.

Hannon (1969) confirmed that normal subjects interpret incongruent communication in an objective manner more frequently than schizophrenics, who were more frequently subjective in their interpretations. And Dil (1971) reported that emotionally disturbed subjects were less accurate in their perceptiveness and attributed more negative meanings to photographed facial emotional expressions than normal subjects.

The purpose of the present study was undergone to determine if perception of facial cues of emotion would be affected differently by various classes of psychopathology (i.e., schizophrenia, neurosis, personality disorder) as compared to a normal population. In addition, this study seeks to determine if age is a significant variable affecting perception of facial cues. Also investigated was the possible difference in perception between normal and emotionally disturbed subjects in terms of attribution of acceptance. Specifically, it was hypothesized that: (1) There are significant differences among normal, schizophrenic, neurotic and personality disorder subjects as to perception of facial cues of six major emotions (happiness, sadness, fear, anger, surprise,

disgust); (2) there is a significant difference between adolescent (13 to 16 years of age) and latency (9 to 12 years of age) subjects as to perception of facial cues of emotion; and (3) there are significant differences among the diagnostic groups in perception of attribution of acceptance.

### Method

#### Design

In order to test the first two stated hypotheses, a 4 X 2 X 6 repeated measures analysis of variance was performed. The 3 independent variables (diagnostic category, age, emotion) were analyzed to determine their impact on the dependent measure (accuracy of perception). In addition, the third hypothesis was tested using a 4 X 2 X 2 repeated measures analysis of variance design. The three independent variables (diagnostic category, age, facial expression) were analyzed to determine their impact on the dependent variable (attribution of acceptance).

#### Subjects

The forty subjects in this study were drawn from the hospital population at Children's Medical Center, Tulsa, Oklahoma, and from the Tulsa County Public School System. Diagnosis of psychopathology was based on the diagnostic impression of the subject formulated by the hospital review committee, consisting of two psychiatrists, the chief clinical psychologist, and the primary therapist. Diagnosis was based upon the definitions prescribed in the Diagnostic Statistical Manual-II (1968).

#### Instruments

The Pictures of Facial Affect (Ekman & Friesen, 1976) series was

used to measure perception of facial cues of emotions. The pictures portray facial expression of six frequently experienced emotions: happiness, sadness, fear, anger, disgust, and surprise with percentage correct ranging from 70% to 90% (see Appendix D).

A seven point Likert type scale was used to assess the perception of facial cues of emotions and a similar scale was used to assess the attribution of acceptance (see Appendix F). The sequence of scale items within the respective instruments were randomized.

The Bender-Gestalt Test (Koppitz, 1964) was used in this study to screen for possible gross perceptual deficits between the groups of subjects. Such screening eliminates the alternate hypothesis that groups of emotionally disturbed subjects and normal subjects are different in their perceptions of all stimuli, irrespective of affective meaning.

#### Procedure

All subjects were given the Bender-Gestalt Test in order to eliminate those with extreme perceptual deficits (1.5 S.D. above the error mean). Subjects then viewed 24 slides selected from the Pictures of Facial Affect series and rated the slides using the first scale. Subjects then viewed a second series of slides taken from the Pictures of Facial Affect series and rated their inferred acceptance value of each slide on the second scale. For both tasks, a given slide was projected on a screen for a 10 second exposure. The subject marked the appropriate scale after each picture exposure.

#### Results

A 4 (Diagnostic Category) X 2 (Age) X 6 (Emotion) repeated measures

analysis of variance was performed on the summed accuracy scores of perception of emotion. The main effect for the variable age (Hypothesis 2) was significant,  $F(1, 32) = 10.23, p .01$  (see Table 1), with the adolescent group being more accurate in their perception of emotions than the latency group.

Although not explicitly hypothesized, the main effect for emotion was found to be significant, ( $F(5,160) = 14.54, p .001$  (see Table 1). The emotion most accurately perceived by the subjects was Happy ( $\bar{X} = 3.675$ ). The emotion least accurately perceived by the subjects was Fear ( $\bar{X} = 2.050$ ). The remaining four emotions in order of accuracy of perception were Surprise ( $\bar{X} = 3.050$ ), Sad ( $\bar{X} = 2.650$ ), Disgust ( $\bar{X} = 2.400$ ), and Anger ( $\bar{X} = 2.275$ ) (see Table 2). The main effect for diagnostic category (Hypothesis 1) was not statistically significant and none of the interaction effects were found to be significant.

A 4 (Diagnostic Category) X 2 (Age) X 2 (happy vs neutral Face) repeated measures analysis of variance was performed on the mean attribution of acceptance scores. A significant main effect was found for Face,  $F(1, 32) = 42.78, p .001$  (see Table 3), but not for the hypothesized differences among diagnostic category. The subjects attributed a significantly greater acceptance to the happy face than to the neutral face. None of the interaction effects was statistically significant.

#### Discussion

The study was designed to investigate the effect of psychopathology and age upon the perception of facial expressions of emotion. In addition, the study was designed to investigate the impact of these

TABLE 1

REPEATED MEASURES ANALYSIS OF VARIANCE

OF ACCURACY OF PERCEPTION OF EMOTIONS

| SOURCE         | <u>SS</u> | <u>df</u> | <u>MS</u> | <u>F</u> |
|----------------|-----------|-----------|-----------|----------|
| Diagnostic (D) | 21.43     | 3         | 7.14      | 2.61     |
| Age (A)        | 28.02     | 1         | 28.02     | 10.23*   |
| D X a          | 8.55      | 3         | 2.85      | 1.04     |
| Error          | 87.60     | 32        | 2.74      |          |
| Emotion (E)    | 70.68     | 5         | 14.14     | 14.54**  |
| E X D          | 17.42     | 15        | 1.61      | 1.19     |
| E X A          | 5.03      | 5         | 1.01      | 1.04     |
| E X D X A      | 17.60     | 15        | 1.17      | 1.21     |
| Error          | 155.60    | 160       | 0.97      |          |

\*  $p < .01$

\*\*  $p < .001$

TABLE 2

MEANS AND STANDARD DEVIATIONS OF ACCURACY  
OF PERCEPTION OF EMOTION FOR EMOTION

| EMOTION  | <u>MEAN</u> | <u>S.D.</u> |
|----------|-------------|-------------|
| Happy    | 3.68        | .693        |
| Sad      | 2.65        | 1.03        |
| Anger    | 2.28        | 1.24        |
| Disgust  | 2.40        | 1.43        |
| Surprise | 3.05        | 1.38        |
| Fear     | 2.05        | 1.32        |



TABLE 3

REPEATED MEASURES ANALYSIS OF VARIANCE  
OF ATTRIBUTION OF ACCEPTANCE

| SOURCE         | <u>SS</u> | <u>df</u> | <u>MS</u> | <u>F</u> |
|----------------|-----------|-----------|-----------|----------|
| Diagnostic (D) | 10.47     | 3         | 3.49      | 2.55     |
| Age (A)        | 0.69      | 1         | 0.69      | 0.51     |
| D X A          | 5.87      | 3         | 1.96      | 1.43     |
| Error          | 43.80     | 32        | 1.37      |          |
| Face (F)       | 72.48     | 1         | 72.48     | 42.78*   |
| F X D          | 7.39      | 3         | 2.46      | 1.45     |
| F X A          | 1.19      | 1         | 1.19      | 0.70     |
| F X D X A      | 8.16      | 3         | 2.72      | 1.61     |
| Error          | 54.22     | 32        | 1.69      |          |

\*  $p < .001$

variables upon attribution of acceptance.

The first hypothesis was not supported by the data. The analysis indicated that psychopathology made no impact on the perception of facial cues of emotions. The schizophrenic, personality disorder and neurotic subjects were no different in accuracy of perception of emotion than the normal subjects.

These results are consistent with the findings of Beakel and Mehrabian (1969) whose study found no support for their hypothesized relationship between incongruent verbal and nonverbal messages communicated to disturbed adolescents, although a relationship between the degree of negative reaction in messages and the degree of psychopathology was suggested. Similarly, although the present study found that the effects of various forms of psychopathology did not reach statistical significance, they are tantalizingly suggestive. These results contrast with the more positive results reported by Wiig and Harris (1974), Kaufman (1969), Dil (1971), and Hannon (1969).

The second hypothesis was supported by the data. It was found that adolescents perceived facial cues of emotion more accurately than latency age children. These findings are consistent with the results of related studies by Jones (1960), Bugenthal (Note 1), Hammon (1969), Bugenthal, Kaswan and Love (1970), Bugenthal, Kaswan, Love, and Fox (1970), and Lanzetta and Kleck (1970). These studies indicate the presence of developmental differences, with young children giving less weight to facial expressions. Adolescents appear to have greater experience with interpreting facial expressions.

The third hypothesis was not supported by the data. Attribution of acceptance was not affected by the three forms of psychopathology (schizophrenia, neurosis, personality disorder). Consequently, these results are not consistent with the findings of Maher (Note 2) and Dil (1971).

The lack of significant results may be due to a number of factors. A most significant consideration is the accuracy of diagnostic procedure. It is generally accepted that the reliability of diagnosing psychopathology is relatively low, suggesting diagnosis to be more an art than a science. A second consideration is the relative unrefinement of the instruments used in the study. It is plausible that the instruments were simply not precise enough to detect existing differences in the perceptions and attributions by the various groups. Because the number of studies concerning the effects of psychopathology upon the perception of emotions are very limited, it is difficult to interpret the meaning of the results of the present study in terms of differing methodologies. Also a factor, not controlled for in the study and, therefore, a possible source of error was the state of treatment of the various disturbed subjects. Some subjects had been in the hospital for a much longer period of time than other subjects.

Finally, aside from possible methodological weaknesses the possibility remains that the hypotheses themselves are based upon insufficiently developed theory. However, methodological refinement appears to offer the richest challenge for further research.

If emotionally disturbed subjects do not accurately perceive facial cues of emotions, training in recognition skills could be a

significant component of therapeutic intervention. Improvement in recognition of emotions could influence factors such as reality testing and the ability to relate to others.

## Reference Notes

1. Bugental, D. E. Characteristics of interpersonal messages in families. In D. J. Kincaid (Chm.) Communication Patterns in the Family and the School as Related to Child Adjustment. Symposium presented at the meeting of the American Psychological Association, New York, September 1966.
2. Maher, B. Delusional thinking and cognitive disorder. Paper presented at the meeting of the American Psychological Association, Toronto, September 1970.
3. Rosenthal, R., Archer, D., DiMatteo, M. R., Koivumaki, J. H. & Rogers, P. L. Assessing sensitivity to nonverbal communication: The PONS test. APA Newsletter (Division 8). January 1974, pp 1-3).

## References

- Beakel, N. G. Parental verbal and nonverbal communication and psychopathology. (Doctoral dissertation, University of California, 1970). Dissertation Abstracts International, 1970, 30, 4325B. (University Microfilms No. 71-582, 95).
- Beakel, N. G., & Mehrabian, A. Inconsistent communications and psychopathology. Journal of Abnormal Psychology, 1969, 74, (1), 126-130.
- Koppitz, E. The Bender-Gestalt Test for Young Children, New York: Grune & Stratton, Inc., 1964.
- Bruner, J. S., & Taguiri, R. The perception of people. In Gardner Lindsey (Ed.), Handbook of Social Psychology, 1954, 11, 634-654.
- Bugental, D. E., Kaswan, J. W., & Love, I. R. Perception of contradictory meanings conveyed by verbal and nonverbal channels. Journal of Personality and Social Psychology, 1970, 16, 647-655.
- Bugental, D. E., Kaswan, J. W., Love, I. R., & Fox, M. N. Child versus adult perception of evaluative messages in verbal, vocal, and visual channels. Developmental Psychology, 1970, 2, 367-375.
- The Committee on Nomenclature and Statistics of the American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (2nd edition). Washington, D. C.: American Psychiatric Association, 1968.

- Darwin, C. The Expression of the Emotions in Man and Animals.  
Chicago: The University of Chicago Press, 1965.
- Davitz, J. The Communication of Emotional Meaning. New York:  
McGraw-Hill, 1964).
- Dil, N. Sensitivity of emotionally disturbed and emotionally non-  
disturbed elementary school children to emotional meanings of  
facial expressions. (Doctoral dissertation, Indiana University,  
1971). Dissertation Abstracts International, 1971, 32, 4448A.  
(University Microfilms No. 72-6768, 196).
- Ekman, P. Body position, facial expression, and verbal behavior  
during interviews. Journal of Abnormal and Social Psychology,  
1964, 68, 295-301.
- Ekman, P., Friesen, W. V., & Ellsworth, P. Emotion in the Human  
Face: Guidelines for Research and an Integration of Findings.  
New York: Pergamon Press, 1972.
- Ekman, P., & Friesen, W. Pictures of Facial Affect. Palo Alto,  
Calif.: Consulting Psychologists Press, Inc., 1976.
- Fairbanks, G., & Pronovost, W. An experimental study of the pitch  
characteristics of the voice during the expression of emotion.  
Speech Monographs, 1939, 6, 87-104.
- Feleky, A. M. The expression of the emotions. Psychological Review,  
1914, 21, 33-41.
- Fernberger, S. W. Six more Piderit Faces. American Journal of  
Psychology. 1927. 39, 162-166.
- Fernberger, S. W. False suggestion and the Piderit model. American  
Journal of Psychology, 1928, 40, 562-568.

- Frijda, N. H. Recognition of emotion. In L. Berkowitz (Eds.), Advances in Experimental Social Psychology (Vol 4), New York: Academic Press, 1969.
- Goodenough, F. The expression of the emotions in infancy. Child Development, 1931, 2, 96-101.
- Guilford, J. P. An experiment in learning to read facial expression. Journal of Abnormal Social Psychology, 1929, 24, 191-202.
- Hannon, N. Responses of normal and schizophrenic children and adolescents to incongruent communications. (Doctoral dissertation, Columbia University, 1969). Dissertation Abstracts International, 1969, 30, 2909. (University Microfilms No. 69-20, 177).
- Izard, C. E. The Face of Emotion. New York: Appleton Century-Crofts, 1971.
- Jarden, E. & Fernberger, S. W. The effect of suggestion on the judgment of facial expression of emotion. American Journal of Psychology, 1926, 37, 565-570.
- Jones, H. E. The longitudinal method in the study of personality. In I. Iscoe & H. W. Stevenson (Eds.), Personality Development in Children. Chicago: University of Chicago Press, 1960.
- Kaufman, J. M. Perception of family and school related variables by school adjusted, school disordered, and institutionalized emotionally preadolescent boys. (Doctoral Dissertation, University of Kansas, 1969). Dissertation Abstracts International, 1969, 31, 362-3. (University Microfilms No. 70-10, 983).
- Landis, C. The interpretation of facial expression in emotion. Journal of General Psychology, 1929, 2, 59-72.



- Langfield, H. S. The judgment of emotions from facial expressions. Journal of Abnormal Social Psychology, 1918, 13, 172-184.
- Lanzetta, J. T. & Kleck, R. E. Encoding and decoding of nonverbal affect in humans. Journal of Personality and Social Psychology, 1970, 16, 12-19.
- Moses, P. The Voice of Neurosis. New York: Grune and Stratton, 1954.
- Munn, N. L. The effect of knowledge of the situation upon judgment of emotion from facial expressions. Journal of Abnormal Social Psychology, 1940, 35, 324-338.
- Ruckmick, C. A. A preliminary study of the emotions. Psychological Monographs, 1921, 30, (3), 30-35.
- Schulze, L. (Experimental Psychology and Pedagogy (translated by R. Pintner). New York: Macmillan, 1912.
- Sherman, M. The differentiation of emotional responses in infants: I. Judgments of emotional responses from motion picture views and from actual observations. Journal of Comparative Psychology, 1927a, 7, 335-351.
- Stratton, G. M. The control of another person by obscure signs. Psychological Review, 1921, 28, 301-314.
- Wiig, E., & Harris, S. Perception and interpretation of nonverbally expressed emotions by adolescents with learning disabilities. Perceptual and Motor Skills, 1974, 38, 239-245.
- Woodworth, R. S. Experimental Psychology, New York: Henry Holt, 1938.

APPENDIX A

PROSPECTUS

"He that has eyes to see and ears to hear may convince himself that no mortal can keep a secret. If his lips are silent, he chatters with his finger-tips; betrayal oozes out of him at every pore (Freud, 1905)."

When two people are involved in a communication process, it is not uncommon for the addressee to misperceive the information that he is receiving. The misperception may be due to unclear verbal content of the message or to incongruent nonverbal gestures. Similarly, extreme psychological stress can often be a major factor in the misinterpretation of verbal and nonverbal communication. The breakdown in the decoding process may be caused by the use of defense mechanisms or by the actual psychological stress.

The transference of information from one person to another has been broadly dichotomized into verbal and nonverbal communication. Furthermore, awareness of the significance of nonverbal communication is illustrated by the increasing amount of research investigations over the past decade. It has been argued that while the verbal component of a statement conveys cognitive information, the nonverbal components (e.g. facial expression, gesture, focal qualities) convey information pertaining to the psychological state of the communicator, such as his attitudes and feelings about the situation, the topic of conversation, the addressee and himself (Davitz, 1964; Fairbanks and Pronovost, 1939, Moses, 1954). In addition, information conveyed by nonverbal cues appears to be less effected by conscious control than the verbal aspects of a communication (Ekman, 1964; Moses, 1954). The nonverbal cues are, therefore, viewed as a major source of information pertaining to unmonitored intentions, perceptions and affective state

of the communicator.

This study seeks to determine if various forms of pathology (i.e., personality disorder, neurosis, schizophrenia) effect the perception of facial cues of emotion and the attribution of acceptance. In addition, it seeks to determine the effects of chronological age in the perception of facial cues of acceptance.

#### REVIEW OF THE LITERATURE

During the 1950's, research studies began reporting systematic or empirical efforts to transcribe nonverbal behaviors into components such as proxemics and paralanguage. The area of nonverbal communication thus began to separate into various modalities including: a. kinesic behavior (body motion, gestures, facial expression, eye movement and posture); b. paralanguage (voice pitch; speech nonfluencies, and non-language sounds including laughing, yawning, grunting and pauses); c. proxemics (social and personal space and its perception (Hall, 1966)); d. olfaction; e. skin sensitivity to touch and temperature; and f. artifacts (dress and cosmetics) (Duncan, 1969). Of the various nonverbal components, kinesics, paralanguage and proxemics have been the most extensively investigated areas. Initial research in these areas were led by Ray Birdwhistell, kinesics; George Trager, paralanguage; and E. T. Hall, proxemics.

Duncan (1969), divided the research on nonverbal behavior into three interlocking phases: a. differentiating specific nonverbal behaviors through a transcription or notation system; b. investigating the nature and breath of internal structure elicited by the behavior; and c. establishing relationships between the nonverbal behaviors and

other variables including personality factors, situational factors, and observers' evaluations. The research generated in any one of these phases has not been segregated, but has facilitated information in the other two areas.

The majority of the research in nonverbal communication has followed one of two broad strategies: the structural approach and the external variable approach (Duncan, 1969). The structural approach studies nonverbal communication as a tightly organized and self contained social system comparable to language, which operates according to a definite set of rules. The major goal of the researcher in structural studies is to explicate the communication rules that govern specific behaviors in specific contexts. Reviews of the research in this area have been discussed by Bateson (1969), Schefflen (1966), Weakland (1967), Birdwhistell (1952), McQuown (1969), and others.

The external variable approach compares the rate of occurrence of a specific nonverbal behavior to external variables such as personality characteristics, interaction situations and reaction responses of judges to the interaction. The external variable approach applies the more traditional psychological research methods to the area of nonverbal communication. Ekman and Friesen (1968) have presented the most detailed review of the literature utilizing this approach. It is important to note that the external variable approach is statistical whereas the structural approach is nonstatistical.

External variable studies can be divided into indicative studies and communicative studies (Ekman and Friesen, 1968). Indicative

studies establish the statistical relationship between a nonverbal behavior and other variables, whereas communicative studies are more concerned with observers' meanings ascribed to specific nonverbal behaviors.

Ekman and Friesen (1967) have used both indicative and communicative methods to investigate various types of information conveyed in nonverbal behaviors (specifically body motion). They distinguish four types of body motion cues: a. body movements; b. body positions involving no movement; c. head positions; and d. facial expressions. Each of these cues reveal information pertaining to the nature and intensity of emotion, the ongoing interpersonal relationship, psychodynamics, and ego defenses. Various research studies have established statistically significant relationships between body motion cues and verbal content and noncontent of speech (Ekman and Friesen, 1968).

Mehrabian (1972) has categorized nonverbal communication research in a similar strategy. Mehrabian uses an explicit-implicit dichotomy to distinguish nonverbal cues from verbal-linguistic cues.

Research in facial communication has been in two major areas: encoding and decoding of cues. Encoding is the transmittance of felt affect via nonverbal cues while decoding involves the interpretation of cues expressed by others, inferring an internal state of emotionality from external signs. The majority of the research on facial expression has been almost exclusively concerned with establishing that judges can agree upon the labels which should be attached to particular facial expressions; that the decoding process is reliable. Recent reviews of

the literature has indicated that accuracy in encoding and decoding facial cues by judges occur with a high degree of agreement; greater than chance (Davitz, 1964; Ekman, Friesen and Ellsworth, 1972; Frijda, 1969, Izard, 1971).

Emphasis upon judgment reliability has led to the specification of categories for reporting subjects' perceptions. The relevance of the response categories are defined by the investigator, not by the subject. The subject labels the stimuli with emotional terms. Many studies require that the subject is forced to select a label from a list of experimentally determined possibilities.

Research has shown that individuals vary markedly in their ability to encode "recognizable affective states" (Thompson and Metzger, 1964), and in the ability to judge correctly others' affective states, a decoding process (Rosenthal, Archer, Koivumaki, DiMatteo and Rogers, Note 2). Levy (1964) reported that encoding and decoding skills are part of a more general communication factor. Lanzetta and Kleck (1970) found an inverse relationship between facial encoding and decoding abilities. Zaidel and Mehrabian's (1969) research established a nonsignificant encoding-decoding correlation in both the visual and auditory channels. Scheffenbauer and Babineau's research (1976) established the attribution of emotions to faces exhibiting non-normative expressions. Characteristics of both the stimulus and observer were significant to the elicitation of emotional attributions.

Another major research component in facial expressions of emotionality is the innate versus learned dichotomy debate. Izard (1971), in a

comprehensive review of the theories of emotional development and expression, discussed the three major theoretical positions: "1. Facial expressions of emotions are innate; 2. The mechanisms for facial expressions are innate, but interaction with the environment is essential to the development of expressive ability; 3. Facial expressions are learned." The three-fold division of the theories is somewhat artificial since there are no exclusive features. Izard's (1971) theory provides support for the following points:

1. "The face is the prime site of emotional expression;"
2. "The early socialization of the child is a strong determinant both of the child's accuracy in recognizing the emotional expressions of others and attitudes he holds towards those emotions;"
3. "The attitudes held toward (or evaluation of) these emotions are closely related to behavioral responses to the expression of the emotions." (Izard, 1971)

There is a large amount of evidence indicating that nonverbal behavior is an important variable in the development of emotional expression and social behavior. Many species of animals exhibit nonverbal behavior with emotional states and these behaviors effect the regulation of social behavior for communication between individuals (Vine, 1970).

Social psychologists have studied abnormality in nonverbal behavior that may interfere with normal social behavior. For example, deprived rhesus monkeys exhibit aberrant social behavior which may be due to



their inability to send and receive species appropriate nonverbal messages (Miller, Caul, and Mirsky), 1967). Among humans, it is thought that nonverbal behavior acts to signal "intimacy" and it has been shown that these behaviors exhibit considerable intraindividual stability over time and are related to low social anxiety (Patterson, 1973).

Social psychologists have also researched the perception of others and their emotions under two interrelated areas: people perception and attribution theory. Bruner and Taguiri (1954) in their review of the literature on person perception discuss the two traditional areas of inquiry--the recognition or identification of emotions in others and the judgment or perception of personality, emphasizing perception of people as one area of social cognition. Recognition studies have usually involved the presentation of an expression of emotion (stimulus) to be labeled by a group of judges. Stimulus modes have included real people (Sternman, 1927a), photographs of people (Ruckmick, 1921; Feleky, 1924; Froi-Wittman, 1930; Schlosberg, 1952; Darwin, 1965; Ekman and Friesen, 1976), drawings or diagrams representing people (Piderit, 1886; Boring and Fitchener, 1923); and recordings of people's voices (Sherman, 1927b). Evidence of recognizability of emotional expressions is unclear, ranging from chance performances in recognizable skills (Jarden and Fernberger, 1926; Sherman, 1927a; Fernberger, 1927, 1928; Guilford, 1929; Landis, 1924, 1929) to considerable accuracy in labelling emotional expression (Schulze, 1912; Feleky, 1914; Langfeld, 1918; Ruckmick, 1921; Stratton, 1921; Goodenough, 1931; Woodworth, 1938; Munn, 1940; Darwin, 1965).

In their review of these studies, Bruner and Taguiri (1954) discuss the technical problems which have confounded the results of these studies. To what extent are emotions recognizable, Bruner and Taguiri (1954) conclude that innate capacity affects only the recognition of the grossest forms of emotional expression and discriminative ability develops only with the individual's social experiences. This hypothesis assumes that social perception accuracy is more of generalized than a specific ability.

Huston and Levinger's (1978) review of the literature on interpersonal attraction and relationships defines interpersonal attraction as attitudinal positivity. Naturalistic settings were the locus for earlier research (Moreno, 1934; Festinger, Schacter and Back, 1950; Newcomb, 1961). However, the laboratory setting has been the site for recent social psychological research on attraction (Arouson, 1970; Byrne, 1971; Lott, 1972). which is a change in focus from research pertaining to attraction in ongoing relationships to attraction and on first impressions. Reviews of the attraction literature have followed a similar pattern. The first overview of the topic (Secord and Backman, 1954) was based primarily on field studies of attraction. More recent reviews have focused primarily on short-term laboratory interaction between strangers (Berscheild, 1969, Byrne, 1973; Caul, 1975). The latest review of the literature of all empirical studies of interpersonal attraction from 1972-1976 by Huston and Levinger (1978) utilized a Person-Other organization schema and classified the research into 3 categories: Impressions, Encounters and Contacts, and Relationships.

Social psychological research of person perception and interpersonal attraction indicates the following tentative conclusion: a person perception accuracy is affected by similarity between the judge and the judged; person perception depends upon cues for aiding perception; judgment is affected by certain systematic errors such as the date effect and logical errors; systematic relationships appear to exist between certain personality variables and judging ability; and a global or intuitive approach to perceptual improves judgment accuracy (Bruner and Taguiri, 1954).

Attribution theory evolved from a number of converging studies of inquiry in the area of social psychology. Attribution theory studies the rules that the average person utilizes in inference of causes of observed behavior. Evolving from a broader field of psychological epistemology--the process that man utilizes to understand his environment, it focuses on the layman's analysis of causal factors of behavior and its effect on his own behavior (Jones, et al; 1971). Initial research was completed by Hider (1958). Jones, et al (1971) classify the research according to emphasis on "certain broad concerns": the motivating factors for the individual's pursuit of causally relevant information; factors determining particular cause assigned to a given event; and the consequences of one causal attribution choice vs. another.

Nesbitt and Valins' (1971) review of the literature on percept causes of one's own behaviors indicate that people tend to infer their beliefs and feelings based on observations of overt behavior of self and others as well as their individual autonomic behavior. Cognitive information of behavior, i.e. supplied by an experimenter) may produce an attitude

inference which the individual attempts to confirm. The more an individual perceives his behavior towards a stimulus product affected by his attitude, the more likely a belief inference is likely to result from observation of that behavior. Thus, Valins and Nesbitt (1971) argue that when others do not share an individual's experiences, the individual is more likely to distrust other people and can develop incorrect and bizarre interpretation of his experience, even to the extent of schizophrenic-delusional systems. Maher (Note 2) likewise disregards the underlying thought disorder basis to schizophrenic delusions, implying that the sensory data is the same for both schizophrenics and normals, but the schizophrenic is not capable of making reasonable inferences. Maher (Note 2) concludes that impairment of the schizophrenic's sensory input channels may distort the stimulus information, perhaps due to biochemical dysfunction, impairment to the central nervous system arousal mechanism. Complimentary to Maher's assumptions, Valins and Nesbitt (1971) suggest that the schizophrenic's arousal mechanism and sensory apparatus may be intact but the breakdown in stimuli encoding may be due to the context in which stimuli is received and evaluated.

Measurement presents a major problem in the study of nonverbal expressions of children. Consequently, results have varied regarding children's abilities to encode and decode nonverbal expressions. Buck (1975) has developed a paradigm for measuring nonverbal expressiveness in young children. The paradigm measures nonverbal expressiveness in terms of encoding (sending ability) and was developed from studies in which an adult encoder viewed and described his subjective reactions to a series

of slides which were emotionally loaded (Buck, Savin, Miller and Caul, 1972; Buck, Miller, and Caul, 1974). Buck's, et al, (1974) findings indicated that women were better senders than men and that accurate senders gave more personal verbal reports of their subjective responses to the slides.

Several studies have suggested that nonverbal expression may become inhibited in the process of socialization (Izard, 1971). Jones (1960) and Lanzetta and Kleck (1970) have theorized that these inhibitions may be associated with increased physiological responding. Perhaps young boys are more likely to internalize overt expression of emotions due to social discouragement. Buck's (1975) study indicated that boys and girls were consistent in ordering their related ability to enact appropriate expressions to different emotions. Both groups were best in showing happiness and progressively worse at enacting sadness, surprise, fear, and anger.

Buck (1975) also found that a child who was a poor sender when observed by college undergraduates also tended to be a poor sender to his parents and rated poor in role-playing. A relationship between sending ability and other characteristics that can disturb social relationships, including aggressiveness and impulsivity was established. Sending ability was positively related to having school friends and negatively related to shyness and solitary play. Experiments did not find evidence of a large sex difference in expressiveness in these children.

One of the more recent areas of study in nonverbal communication is the evaluation of encoding and decoding of facial cues by various pathological groups. Studies have been limited in number and research results

have been conflicting. Beakel and Mehrabian (1969) investigated the possible incongruity between verbal and nonverbal parental messages to disturbed adolescents. Although no support was found for the hypothesized relationship between incongruity and the degree of pathology, results indicated a relationship between the amount of negative attitude in parental messages and the degree of psychopathology of the adolescent within the family. Communication of attitude was defined as "the degree of liking, preference, or positive evaluation expressed by one individual toward another." Beakel and Mehrabian (1969) state that attitudes are conveyed by verbalizations (contents and tone of voice), facial expression, body position and gestures.

Haley (1963) has suggested a correlation between the frequency of occurrence of inconsistent attitude communication in a family and the degree of psychopathology of the most disturbed member of that family. Mehrabian and Ferris (1967) found that inferred attitude is a linear function of the independent affects of facial and vocal components, with the facial component being the most important. Mehrabian and Weiner (1967) suggest that negative attitude messages can contribute to severe psychopathological functions.

Wiig and Harris (1974) found evidence to suggest that learning disabled adolescents misinterpret the emotions judged as relatively positive for emotions judged as relatively negative. The adolescents' responses also lacked the "teenage quality" observed in academically achieving adolescents.

Kaufman (1969) explored the perception of family and school related variables with three groups of preadolescent boys: school adjusted,

school disordered and institutional emotionally disturbed. The groups which were known to have experienced a greater degree of negative interaction with their environment, tended to express more extreme and more positive perceptions of family and school related variables. These response tendencies were interpreted as suggesting the operation of dynamic defense mechanisms and unrealistic assertions about environment events.

In a similar study, Beakel (1970) explored the relationship between parental verbal and nonverbal communication and psychopathology to adolescents in four symptom groups: aggressive, acting-out; acting family conflict; passive-negative; and withdrawn. Dynamism results were interpreted as reflecting a characteristic style of communication which affect the child's behavior through modeling (Beakel, 1970). Modeling the parents' communication system was suggested to have an effect on how the child copes with parental figures and others.

Hannon's (1969) study, testing hypotheses derived from the double bind position examined responses of normal and schizophrenic children and adolescents to incongruent communication. Results confirmed that normal subjects interpret incongruent communication in an objective manner more frequently than schizophrenics, and that schizophrenics are more frequently subjective in their interpretations of incongruent messages. It was also established that recognition and criticism of inconsistent were only given by subjects twelve years or older.

Dil (1971) examined the relationship between the ability to perceive emotional meanings of facial expressions and individual differences in the following emotional expressive behavioral styles: emotionally dis-

turbed, acting noncoping, emotionally disturbed, passive noncoping; and emotionally nondisturbed. It was found that both groups of emotionally disturbed subjects were: less accurate in their perceptiveness and attribute more negative meanings to photographed facial emotional expressions, thus showing different patterns. Furthermore, differences between emotionally disturbed and emotionally nondisturbed responses cannot be attributed to perceptual differences.

#### STATE OF THE PROBLEM

The purpose of this study is to determine if perception of facial cues of emotion is affected differently by various modes of psychopathology (i.e., personality disorder, neurosis, schizophrenia) as compared to a normal population. In addition, this study seeks to determine if a difference in perception exists between the normal and emotionally disturbed subjects in terms of attribution of acceptance. This study also seeks to determine if age appears to be a significant variable affecting perception of facial cues.

The preceding review of the literature indicates that the following relevant points can be drawn.

1. Facial cues appear to be the most important component of nonverbal behavior for the transmission of affect, in particular, gestures of acceptance.
2. Perception of attitude may be defined as the degree of liking, preference, or positive evaluation expressed by one individual toward another person, event, or object.
3. Although psychopathology appears to be a major variable affecting the perception of nonverbal cues of affect,



the results are conflicting. Results of studies assessing the specific type of psychopathology and its affect upon perception of nonverbal cues have been vague. Furthermore, modalities for operationally defining psychopathology have been inconsistent.

4. There appears to be a difference in perception of nonverbal cues of affect between adolescents and latency aged children, suggesting an inhibition of perception with increased socialization.

The above factors indicate the following hypotheses to be tested in this study.

- I. There will be a significant difference among verbal, schizophrenic, neurotic and personality disorder subjects in perception of facial cues of six major emotions (happy, sad, fear, anger, surprise, disgust). If hypotheses I is found to be significant, then the following subhypothesis will be tested.
  - Ia. Normal subjects will perceive facial gestures of emotions more accurately than schizophrenic subjects.
  - Ib. Subjects with personality disorders will perceive facial gestures of emotion more accurately than schizophrenic subjects.
  - Ic. Subjects with neurotic disorders will perceive facial gestures of emotions more accurately than subjects with personality disorders.

- II. There will be a significant difference in perception among the groups in terms of attribution of acceptance.
- III. There will be a significant difference between adolescent (13 to 16 years of age) and latency (9 to 12 years of age) subjects in perception of facial cues of emotion.

## METHOD

### Subjects

The subjects for this study will be drawn from the hospital population at Children's Medical Center, Tulsa, Oklahoma, and from the Tulsa County Public School System. Forty subjects will be used for this study. Participation in the study will be strictly on a voluntary basis. Parental permission for participation in the study will be required. Diagnosis of psychopathology will be based on the diagnostic impression of the subject formulated at the second hospital review committee. During the meeting, a professional team consisting of two psychiatrists, the chief clinical psychologist, and the primary therapist determine the diagnosis, as based upon the definitions prescribed in the Diagnostic Statistical Manual-II. Latency age subjects will be between the ages of 9 to 12 years old, while adolescent subjects will range in age from 13 to 16 years old. No consideration will be given to variables such as gender, level of education, or individual experiences.

### Instruments

The Pictures of Facial Affect developed by Ekman and Friesen (1976) will be used to measure perception of facial cues of emotions. The pictures portray facial expression of six frequently experienced emotions: happiness, sadness, fear, anger, disgust, and surprise. The photographs

have yielded highly consistent judgments of facial expression of affect. A more detailed description of the Pictures of Facial Affect, along with the procedures and results of the studies are included in the appendix.

The Semantic Differential, developed by Osgood, Suci, and Tannenbaum (1957) will be used to assess the meaning of perception of facial cues of emotions. Within the framework of learning theory, Osgood, et al (1957) have attempted to specify the objective stimulus and response conditions under which a representational mediation process develops and becomes identified with a cognition meaning. Meaning develops as a representational process because signs (symbols or words) come to represent significant, thus being measured by the use of a dimensional semantic space.

Research with children has shown that the factors identified by Osgood, et al (1957), in which adults were used as subjects may be considered stabilized in children as young as 9 years of age (Lilly, 1965; Donahoe, 1961; Maltz, 1963; Barnard, 1966). Donahoe (1961) found a high correlation between pictures and words used as signs of the same significance at ages of 7, 9, 12, and 22 years. Maltz (1963) replicated the study, obtaining reliability coefficients in the .80s and .90s for elementary school children.

The Bender-Gestalt Test has been used to test the ability to perceive nonemotional complex stimuli. The test will be used in this study to control for possible perceptual differences between the groups of subjects in order to rule out the alternate hypothesis that groups of emotionally disturbed subjects and normal subjects are different in their perceptions of all stimuli, irrespective of affective meaning.

### Procedure

All subjects will first be given the Bender-Gestalt Test in order to eliminate extreme perceptual deficits (1.5 S.D. above the mean). Subjects will then view 26 selected slides of the Pictures of Facial Affect series and rate the slides using the Semantic Differential instrument.

Each picture will be projected on a screen for a 10 second exposure. The student will then have 10 seconds to mark the semantic differential.

Subjects will then view a second series of slides taken from the Pictures of Facial Affect series that infer acceptance and then rate another semantic differential scale. This second experimental task will measure the attribution of acceptance.

### Statistical Design

Each of the subjects' scores on the Semantic Differential for each slide will be totalled and then averaged. An analysis of variance will be completed for Hypothesis I and Hypothesis II. If Hypothesis I is found to be significant, then multiple contrast tests will be completed for the subhypotheses Ia, Ib, and Ic.

### Importance of the Study

The results of this study could have certain direct effects on future research in the area of nonverbal communication. If psychopathology is related to perception of nonverbal facial cues of acceptance, this study will help to clarify the relationship of specific diagnostic variables, such as the component of anxiety in pathology, to perceptual styles. These results may also be significant in terms of treatment intervention for specific diagnostic categories for increased perception

of acceptance. In addition, this study may help to clarify the effect of age on the perception of facial cues.

Reference Notes

1. Maher, B. Delusional thinking and cognitive disorder. Paper presented at the meeting of the American Psychological Association, Toronto, September, 1970.
2. Rosenthal, R., Archer, D., DiMatteo, M. R., Koivumaki, J. H., & Rogers, P. L. Assessing sensitivity to nonverbal communication: The PONS test. APA Newsletter (Division 8). January 1974, pp 1-5.

## References

- Alexander, R. D. The evolution of Social behavior. Annual Review of Ecological Systems. 1974, 5: 325-83.
- Alexander, R. D. Natural selection in social exchange. In R. L. Burgess, T. L. Huston (Eds.), Social Exchange in Developing Relationships. New York: Academic Press, 1978.
- Allport, F. H. Social Psychology. Boston: Houghton Mifflin, 1924.
- Arnold, M. B. Emotion and personality (Vol I). Psychological Aspects. New York: Columbia University Press, 1960.
- Aronson, E. Some antecedents of interpersonal attraction. In W. J. Arnold, D. Levine (Eds.) Nebraska Symposium on Motivation, Lincoln: U. Nebraska Press. 1966, p. 143-77.
- Aronson, E., Linder, D. Gain and loss of esteem as determinants of interpersonal attractiveness. Journal of Experimental Social Psychology, 1965, 1: 156-172.
- Barnard, J. W. The effects of anxiety on connotative meaning. Child Development, 1966, 37, 461-472.
- Bateson, G., Jackson, D. D., Haley, J., & Weakland, J. Toward a theory of schizophrenia. Behavioral Science. 1956, 1, 251-264.
- Bateson, G. Communication. In N. A. McQuown (Ed.), Natural History of an Interview. New York: Grune and Stratton, 1969.
- Beakel, N. G. Parental verbal and nonverbal communication and psychopathology. (Doctoral dissertation, University of California) Los

- Angeles: University microfilm, 1970. No. 71-582.
- Beakel, N. G., & Mehrabian, A. Inconsistent communications and psychopathology. Journal of Abnormal Psychology, 1969, 74, (1), 126-130.
- Berscheid, E., & Walster, E. Interpersonal Attraction. Reading, Mass.: Addison-Wesley, 1969.
- Birdwhistell, R. L. Introduction to Kinesics. Louisville: University of Louisville Press, 1952.
- Boring, E. G. & Titchener, E. B. A model for the demonstration of facial expression. American Journal of Psychology, 1923, 34, 471-485.
- Bowlby, J. Attachment and Loss, I: Attachment. New York: Basic Books, 1969.
- Bruner, J. S., & Taguiri, R. The perception of people. In Gardner Lindsey (Ed.), Handbook of Social Psychology, 1954, 11, 634-654.
- Buck, R. Nonverbal communication of affect in children. Journal of Personality and Social Psychology, 1975, 31 (4), 644-653.
- Buck, R., Miller, R. E., & Caul, W. F. Sex, personality and physiological variables in the communication of emotion via facial expression. Journal of Personality and Social Psychology, 1972, 23 362-371.
- Bugental, D. E., Kaswan, J. W., & Love, I. R. Perception of contradictory meanings conveyed by verbal and nonverbal channels. Journal of Personality and Social Psychology, 1970, 16, 647-655.
- Bugental, D. E., Kaswan, J. W., Love, I. R., & Fox, M. N. Child versus adult perception of evaluative messages in verbal, vocal, and visual channels. Developmental Psychology, 1970, 2, 367-375.



- Byrne, D. The Attraction Paradigm. New York: Academic, 1971.
- Byrne, D., & Griffitt, W. Interpersonal attraction. In Annual Review of Psychology, 1973, 24, 317-36.
- Clau, G. L. International Attraction: An Overview. Morristown, N. J., General Learning, 1975.
- Darwin, C. The Expression of the Emotions in Man and Animals. Chicago: The University of Chicago Press, 1965.
- Davitz, J. The Communication of Emotional Meaning. New York: McGraw-Hill, 1964.
- Deutsch, F., & Murphey, W. F. The Clinical Interview (Vols 1 and 2). New York: International Universities Press, 1955.
- Dil, N. Sensitivity of emotionally disturbed and emotionally nondisturbed elementary school children to emotional meanings of facial expressions. (Doctoral dissertation, Indiana University). Bloomington: University microfilm, 1971, No. 72-6768.
- Donohoe, J. W. Changes in meaning as a function of age. Journal of Genetic Psychology, 1961, 99, 23-28.
- Dornbush, S. M., Hastorf, A. H., Richardson, S. A., Mizzy, R. E., and Vreeland, R. S. The perceiver and the perceived: Their relative influence on the categories of interpersonal cognition. Journal of Personality and Social Psychology, 1965, 1, 434-440.
- Duncan, K. The role of eye-muscles and mouth-muscles in the expression of the emotions. Genetic Psychological Monograph, 1927, 2, (3), 199-233.
- Ekman, P. Body position, facial expression, and verbal behavior during

- interviews. Journal of Abnormal and Social Psychology, 1964, 68, 295-301.
- Ekman, P., Friesen, W. V., & Ellsworth, P. Emotion in the Human Face: Guidelines for Research and an Integration of Findings. New York: Pergamon Press, 1972.
- Ekman, P., & Friesen, W. V. Hand and body cues in the judgment of emotion: A reformulation. Perceptual and Motor Skills, 1967, 24, 711-724.
- Ekman, P. & Friesen, W. V. Nonverbal behavior in psychotherapy research. In J. Shelien (Ed.), Research in Psychotherapy. Vol 3. Washington, D.C.: American Psychological Association, 1968.
- Ekman, P., Sorenson, E. R., & Friesen, W. V. Pan-Cultural elements in facial displays of emotion. Science, 1969, 164, 80-86.
- Ekman, P. & Friesen, W. Pictures of Facial Affect. Palo Alto, Calif., Consulting Psychologists Press, Inc., 1976.
- Fairbanks, G., & Pronovost, W. An experimental study of the pitch characteristics of the voice during the expression of emotion. Speech Monographs, 1939, 6, 87-104.
- Feleky, A. M. The expression of the emotions. Psychological Review, 1914, 21, 33-41.
- Feleky, A. M. Feelings and Emotions. New York: Pioneer Press, 1924.
- Fernberger, S. W. Six more Piderit Faces, American Journal of Psychology, 1927, 39, 162-166.
- Fernberger, S. W. False suggestion and the Piderit model. American Journal of Psychology, 1928, 40, 562-568.
- Festinger, L., Schachter, S., & Back, K. Social Pressures in Informal

- Groups: A Study of Human Factors in Housing. Stanford: Stanford U. Press, 1950.
- Finlayson, G. J. Effects of exposure to and reappraisal of facial expressions depicting affect. (Doctoral dissertation, University of Toronto), Toronto: University microfilm, 1972, No. National Library of Canada at Ottawa.
- Freud, S. Fragment of an analysis of a case of hysteria (1905). In Collected Papers, (Vol 3). New York: Basic Books, 1959.
- Frijda, N. H. Recognition of emotion. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology (Vol 4), New York: Academic Press, 1969.
- Frois-Wittman, J. The judgment of facial expression. Journal of Experimental Psychology, 1930, 13, 113-151.
- Gates, G. S. The role of the auditory element in the interpretation of emotion. Psychological Bulletin, 1927, 24, 175.
- Gewirtz, J. L. Attachment and Dependency, New York: Wiley, 1972.
- Goodenough, F. The expression of the emotions in infancy. Child Development, 1931, 2, 96-101.
- Guilford, J. P. An experiment in learning to read facial expression. Journal of Abnormal Social Psychology, 1929, 24, 191-202.
- Haley, J. Strategies of Psychotherapy. New York: Grune and Stratton, 1963.
- Hall, E. T. The Hidden Dimension. Garden City, N. J.: Doubleday, 1966.
- Hannon, N. Responses of normal and schizophrenic children and adolescents to incongruent communications. (Doctoral dissertation, Columbia University). New York: University microfilm, 1969, No. 69-20, 177.

- Heider, F. Social perception and phenomenal causality. Psychology Review, 1944, 51: 358-374.
- Heider, F. Attitudes and cognitive organization. Journal of Psychology, 1946, 21: 107-112.
- Heider, F. The Psychology of Interpersonal Relations. Wiley, 1958.
- Huston, T. L., & Levinger, G. Interpersonal attraction and relationships. In Annual Review of Psychology, 1978, 27: 115-56.
- Izard, C. E. The emotion as a culture-common framework of motivational experiences and communication cues. Technical Report No. 30, Office of Naval Research, 1968.
- Izard, C. E. The Face of Emotion. New York: Appleton-Century-Crofts, 1971.
- James, P. B. Children's interpretations of multichannel communications conveying verbal and nonverbal meanings. (Doctoral dissertation, The Ohio State University). Columbus: University microfilm, 1969, No. 70-14, 144.
- Jarden, E. & Fernberger, S. W. The effect of suggestion on the judgment of facial expression of emotion. American Journal of Psychology, 1926, 37, 565-570.
- Jenness, A. The effects of coaching subjects in the recognition of facial expressions. Journal of General Psychology, 1932b, 1, 163-178.
- Jones, E. E., Kanouse, D. E., Kelly, H. H., Nesbitt, R. E., Valins, S. & Weiner, B. Attribution: Perceiving the Causes of Behavior. Morristown, New Jersey. General Learning Press, 1971.
- Jones, H. E. The longitudinal method in the study of personality. In

- I. Iscoe and H. W. Stevenson (Eds.), Personality Development in Children. Chicago: University of Chicago Press, 1960.
- Kauffman, J. M. Perception of family and school related variables by school adjusted, school disordered, and institutionalized emotionally preadolescent boys. (Doctoral dissertation, University of Kansas), Kansas City: University microfilm, 1969, No. 70-10, 983.
- Knower, R. H. Studies in the symbolism of voice and action: The use of behavioral and tonal symbols as tests of speaking achievement. Journal of Applied Psychology, 1945, 29, 229-235.
- Landis, C. The interpretation of facial expression in emotion. Journal of General Psychology, 1929, 2, 59-72.
- Langfield, H. S. The judgment of emotions from facial expressions. Journal of Abnormal Social Psychology, 1918, 13, 172-184.
- Lanzetta, J. T. & Lkeck, R. E. Encoding and decoding of nonverbal affect in humans. Journal of Personality and Social Psychology, 1970, 16, 12-19.
- Lazarus, R. S. Psychological Stress and the Coping Process. New York: McGraw-Hill, 1966.
- Levitt, E. A. The relationship between abilities to express emotional meanings vocally and facially. In J. R. Davitz (Ed.), The Communication of Emotional Meaning. New York: McGraw-Hill, 1964.
- Levy, P. K. The ability to express and perceive vocal communication of feelings. In J. R. Davitz (Ed.), The Communication of Emotional Meanings. New York: McGraw-Hill, 1964.
- Lewis M. & Rosenblum, L. A., The Effect of the Infant on its Caregiver. New York: Wiley, 1974.

- I. Iscoe and H. W. Stevenson (Eds.), Personality Development in Children. Chicago: University of Chicago Press, 1960.
- Kauffman, J. M. Perception of family and school related variables by school adjusted, school disordered, and institutionalized emotionally preadolescent boys. (Doctoral dissertation, University of Kansas), Kansas City: University microfilm, 1969, No. 70-10, 983.
- Knower, R. H. Studies in the symbolism of voice and action: The use of behavioral and tonal symbols as tests of speaking achievement. Journal of Applied Psychology, 1945, 29, 229-235.
- Landis, C. The interpretation of facial expression in emotion. Journal of General Psychology, 1929, 2, 59-72.
- Langfield, H. S. The judgment of emotions from facial expressions. Journal of Abnormal Social Psychology, 1918, 13, 172-184.
- Lanzetta, J. T. & Lkeck, R. E. Encoding and decoding of nonverbal affect in humans. Journal of Personality and Social Psychology, 1970, 16, 12-19.
- Lazarus, R. S. Psychological Stress and the Coping Process. New York: McGraw-Hill, 1966.
- Levitt, E. A. The relationship between abilities to express emotional meanings vocally and facially. In J. R. Davitz (Ed.), The Communication of Emotional Meaning. New York: McGraw-Hill, 1964.
- Levy, P. K. The ability to express and perceive vocal communication of feelings. In J. R. Davitz (Ed.), The Communication of Emotional Meanings. New York: McGraw-Hill, 1964.
- Lewis M. & Rosenblum, L. A., The Effect of the Infant on its Caregiver. New York: Wiley, 1974.

- Lewis, M. & Rosenblum, L. A. Friendship and Peer Relations. New York: Wiley, 1975.
- Lott, A. J., Lott, B. E. The power of liking. Adv. Exp. Soc. Psychology, 1972, 6: 109-48.
- Maltz, H. E. Ontogenetic change in the meaning of concepts as measured by the semantic differential. Child Development, 1963, 34, 667-674.
- Mehrabian, A. Nonverbal Communication. Chicago: Aldine-Atherton, Inc., 1972.
- Mehrabian, A. & Ferris, S. R. Inference of attitudes from nonverbal communication in two channels. Journal of Consulting Psychology, 1967, 6, 109-114.
- Miller, R. E., Caul, W. F., & Mirsky, I. E. Communication of affects between feral and socially isolated monkeys. Journal of Personality and Social Psychology, 1967, 7, 231-239.
- Mishler, E. E., & Waxler, N. E. Interaction in Families. New York: Wiley, 1968.
- Morino, J. L. Who shall survive? Washington, D. C.: Nervous Mental Disorder Monograph, 1934.
- Moses, P. The Voice of Neurosis. New York: Grune and Stratton, 1954.
- Munn, N. L. The effect of knowledge of the situation upon judgment of emotion from facial expressions. Journal of Abnormal Social Psychology, 1940, 35, 324-338.
- Newcomb, T. M. The Acquaintance Process. New York: Holt, Rinehart, and Winston, 1961.
- Nisbett, R. & Valins, S. Perceiving the causes of one's own behavior. In Edward E. Jones, David E. Kanouse, Harold H. Kelly, Richard E.

- Nisbett, Stuart Valins, and Bernard Weiner (Eds.), Attribution: Perceiving the Causes of Behavior. Morristown, New Jersey. General Learning Press, 1971.
- Osgood, C. E. Dimensionality of the semantic space for communication via facial expression. Scandinavian Journal of Psychology, 1966, 7, 1-30.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. The Measurement of Meaning. Urbana, Ill.: University of Illinois, 1957.
- Patterson, M. L. Stability of nonverbal immediacy behaviors. Journal of Experimental Social Psychology, (1973), 9, 97-109.
- Piderit, T. Minick and Physiognomik. Detmold: Meyer (H. Renecke), 1886.
- Ruckmick, C. A. A preliminary study of the emotions. Psychological Monographs, 1921, 30, (3). 30-35.
- Schleflen, A. E. Stream and Structure of Communicational Behavior. Bloomington: University of Indiana Press, 1969.
- Schleflen, A. E. Natural history method in psychotherapy: Communicational research. In L. A. Gottschalk and A. H. Auerback (Eds.). Methods of Research in Psychotherapy. New York: Appleton-Century-Crofts, 1966.
- Schiffenbauer, A. & Babineau, A. Sex role stereotypes and the spontaneous attribution of emotion. Journal of Research in Personality, 1976, 10, 137-145.
- Schlosberg, H. The description of facial expressions in terms of two dimensions. Journal of Experimental Psychology, 1952, 44, 229-237.



- Schuham, A. I. The double-bind hypothesis a decade later. Psychological Bulletin, 1967, 68, 409-416.
- Schulze, L. Experimental Psychology and Pedagogy (Translated by R. Pintner). New York: Macmillan, 1912.
- Secord, P. F., & Backman, C. W. Social Psychology. New York: McGraw-Hill, 1964.
- Sherman, M. The differentiation of emotional responses in infants: I. Judgments of emotional responses from motion picture views and from actual observations. Journal of Comparative Psychology, 1927a, 7, 335-351.
- Sherman, M. The differentiation of emotional responses in infant: II. The ability of observers to judge the emotional characteristics of the crying of infants and of the voice of an adult. Journal of Comparative Psychology, 1927b, 7, 335-351.
- Stratton, G. M. The control of another person, by obscure signs. Psychological Review, 1921, 28, 301-314.
- Tomkins, S. S. Affect, Imagery, Consciousness (Vol II): The Negative Affects. New York: Springer, 1963.
- Thompson, D. F. & Meltzer, L. Communication of emotional intent by facial expression. Journal of Abnormal and Social Psychology, 1964, 68, 129-135.
- Trivers, R. L. The evolution of reciprocal altruism. Quarterly Review of Biology, 1971, 46: 35-57.
- Valins, S. & Nisbett, R. Attribution processes in the development and treatment of emotional disorders. In Edward Jones, David E. Kanouse, Harold H. Kelly, Richard E. Nisbett, Stuart Valins, and

- Bernard Weiner (Eds.), Attribution: Perceiving the Causes of Behavior. Morristown, New Jersey. General Learning Press, 1971.
- Vine, I. Communication by facial-visual signals. In J. H. Crook (Ed.) Social Behavior in Birds and Mammals. New York: Academic Press, 1970.
- Weakland, J. H. The "double-bind" hypothesis of schizophrenia and three-party interaction. In D. D. Jackson (Ed.), The Etiology of Schizophrenia. New York: Basic Books, 1961.
- Weakland, J. H. Communication and behavior--An introduction. American Behavioral Scientist, 1967, 10 (8), 1-4.
- Wiig, E. & Harris, S. Perception and interpretation of nonverbally expressed emotions by adolescents with learning disabilities. Perceptual and Motor Skills, 1974, 38, 239-245.
- Wilson, E. O. Sociobiology. Cambridge, Mass. Harvard U. Press, 1975.
- Woodworth, R. S. Experimental Psychology. New York: Henry Holt, 1938.

APPENDIX B  
RESEARCH PROPOSAL TO COMMITTEE  
FOR HUMAN RESEARCH

July 18, 1978

To: David Barber, M.D.  
Chairman  
Committee for Human Research  
Children's Medical Center

From: Perry T. Guthrie  
Clinical Psychology Intern

Research Proposal:

Perception of Emotions and Attribution of Acceptance

By Normal and Emotionally Disturbed Subjects

The transference of information from one person to another has been broadly dichotomized into verbal and nonverbal communication. Awareness of the significance of nonverbal communication is illustrated by the increasing amount of research investigations over the past decade. It has been argued that while the verbal component of a statement conveys cognitive information, the nonverbal components (e.g. facial expression, gesture, vocal qualities) convey information pertaining to the psychological state of the communicator, such as his attitudes and feelings about the situation, the addressee and himself. In addition, information conveyed by nonverbal cues appears to be less affected by conscious control than the verbal aspects of a communication.

The nonverbal cues are, therefore, viewed as a major source of information pertaining to unmonitored intentions, perceptions, and affective state of the communicator. Research has shown that facial cues are the primary indicators for perception of emotions.

Many research studies have evaluated the perception of facial cues of emotions by normal subjects, primarily college students. Few experimental studies have assessed the perception of emotions (happy, sad, fear, anger, surprise, disgust) by emotionally disturbed subjects. Of the studies reported, the results are conflicting. Furthermore, no research has been reported comparing the perception of facial cues of emotions by various types of disturbed subjects (i.e., personality disorder, neurosis, schizophrenia). In addition, no research has evaluated the attribution of acceptance by these various groups of subjects. The review of the research literature over the last 15 years

in the areas of nonverbal communication, facial gestures, perception of emotions and attribution of acceptance indicates that:

1. Facial cues appear to be the most important component of nonverbal behavior for the transmission of affect, in particular, gestures of acceptance.
2. Perception of attitude may be defined as the degree of liking, preference, or positive evaluation expressed by one individual toward another person, event, or object.
3. Although psychopathology appears to be a major variable affecting the perception on nonverbal cues of affect, the results are conflicting. Results of studies assessing the specific type of psychopathology and its affect upon perception of nonverbal cues have been vague. Furthermore modalities for operationally defining psychopathology have been inconsistent.
4. There appears to be a difference in perception of nonverbal cues of affect between adolescents and latency aged children, suggesting an inhibition of perception with increased socialization.

The purpose of this study is to determine if perception of facial cues of emotion is affected differently by various modes of psychopathology (i.e., personality disorder, neurosis, schizophrenia) as compared to a normal population. In addition, this study seeks to determine if a difference in perception exists among normal and emotionally disturbed subjects in terms of attribution of acceptance. This study also seeks to determine if age appears to be a significant variable affecting perception of facial cues of emotions.

The above factors indicate the following hypotheses to be tested in this study.

- I. There will be a significant difference among normal, schizophrenic, neurotic and personality disorder subjects in perception of facial cues of six major emotions (happy, sad, fear, anger, surprise, disgust).

If hypothesis I is found to be significant, then the following sub-hypotheses will be tested.

- Ia. Normal subjects will perceive facial gestures of emotions more accurately than schizophrenic subjects.
- Ib. Subjects with personality disorders will perceive facial gestures of emotions more accurately than schizophrenic subjects.
- Ic. Subjects with neurotic disorders will perceive facial gestures of emotions more accurately than subjects with personality disorders.
- II. There will be a significant difference in perception among the groups in terms of attribution of acceptance.
- III. There will be a significant difference between adolescents and latency age subjects in perception of facial cues of emotion.

## METHOD

### Subjects

The subjects for this study will be drawn from the hospital population at Children's Medical Center and from the Tulsa County Public School System. A minimum of forty subjects will be used for this study. The thirty subjects selected from Children's Medical Center will participate strictly on a voluntary basis. Parental permission for participation in the study will be acquired if thought necessary.

### Instruments

The Pictures of Facial Affect developed by Ekman and Friesen (1976) will be used to measure perception of facial cues of emotions. The pictures portray facial expression of six frequently experienced emotions: happiness, sadness, fear, anger, disgust, and surprise. The photographs have yielded highly consistent judgments of facial expression of affect. A more detailed description of the instrument is enclosed.

The Semantic Differential, developed by Osgood, Suci, and Tannenbaum (1957) will be used to assess the meaning of perception of facial cues of emotions and attribution of acceptance.

The Bender-Gestalt Test has been used to test the ability to perceive non-emotional complex stimuli. The test will be used in this study to control for possible perceptual differences between the groups of subjects in order to rule out the alternate hypothesis that groups of emotionally disturbed subjects and normal subjects are different in their perceptions of all stimuli, irrespective of affective meaning.

#### Procedure

All subjects will first be given the Bender-Gestalt Test in order to eliminate extreme perceptual deficits. Subjects will then view the 26 slides of the Pictures of Facial Affect and rate the slides, using the Semantic Differential instrument, by placing a pencil mark upon a dimensioned line.

Each picture will be projected upon a screen for a 10 to 15 second exposure. The student will then have a 10 second period to mark the semantic differential.

#### Statistical Design

Each of the subjects' scores on the Semantic Differential for each slide will be totalled and then averaged. An analysis of variance will be completed for Hypotheses I, II, and III. If H I is found to be significant, then multiple contrast tests will be completed for the subhypotheses Ia, Ib, and Ic.

#### Importance of the Study

The results of this study could have certain direct effects on



future research in the area of nonverbal communication. If psychopathology is related to perception of nonverbal facial cues of emotions and to attribution of acceptance, this study will help to clarify the relationship of specific diagnostic variables, such as the component of anxiety in pathology, to perceptual styles. These results may also be significant in terms of treatment intervention for specific diagnostic categories for increased attribution of acceptance. In addition, this study may help to clarify the effect of age on the perception of facial cues of emotion.

APPENDIX C

PARENTAL PERMISSION FORM AND  
RESEARCH PROJECT DESCRIPTION

August 1, 1978

Dear \_\_\_\_\_,

I am a clinical psychology intern completing a year of formal training at Children's Medical Center. In partial fulfillment of my degree, I am running a research study on perception of emotions and attribution of acceptance. Consequently, I am using children at the hospital for research participants, strictly on a volunteer basis.

Enclosed is a brief description of the research project. I would appreciate if you would give permission for your child to participate. If you will, please sign the enclosed permission form and mail it back to me.

Your assistance will be greatly appreciated.

Yours truly,

Perry T. Guthrie  
Clinical Psychology Intern\*

\*(Hospital designated title)

Name

Local Phone Number

\_\_\_\_\_  
Birthday\_\_\_\_\_  
Local Address

\_\_\_\_\_  
The purpose of the project is to determine how children and adolescents perceive facial gestures of emotion and attribute acceptance.

The procedure consists of the study looking at a picture slide of a face and simply marking on a sheet of paper to what extent the face is happy, sad, angry, surprised or disgusted. The student also marks how much he would like to play a game, such as baseball or dolls, with the person in the picture.

The procedure is painless and non-stressful. There are no foreseeable risks associated with the described procedure. However, since it is research, the subject should understand that a small element of risk always exists when we are dealing with the unknown. For this reason, I am requesting signed consent.

Participation is on a volunteer basis and parents or guardians may withdraw their consent any time prior to the implementation of the study.

\_\_\_\_\_  
This is to inform all concerned that I, the parent or legal guardian of (your son or daughter's name), \_\_\_\_\_ have read and understand the terms of the project described. I freely give consent to use my son/daughter as a research subject.

Signature of parents or guardian

\_\_\_\_\_

APPENDIX D

PICTURES OF FACIAL AFFECT

PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs \_\_\_\_\_
2. Colored illustrations \_\_\_\_\_
3. Photographs with dark background \_\_\_\_\_
4. Illustrations are poor copy \_\_\_\_\_
5. Print shows through as there is text on both sides of page \_\_\_\_\_
6. Indistinct, broken or small print on several pages ✓ throughout  
\_\_\_\_\_
7. Tightly bound copy with print lost in spine \_\_\_\_\_
8. Computer printout pages with indistinct print \_\_\_\_\_
9. Page(s) \_\_\_\_\_ lacking when material received, and not available  
from school or author \_\_\_\_\_
10. Page(s) \_\_\_\_\_ seem to be missing in numbering only as text  
follows \_\_\_\_\_
11. Poor carbon copy \_\_\_\_\_
12. Not original copy, several pages with blurred type \_\_\_\_\_
13. Appendix pages are poor copy \_\_\_\_\_
14. Original copy with light type \_\_\_\_\_
15. Curling and wrinkled pages \_\_\_\_\_
16. Other \_\_\_\_\_

University  
Microfilms  
International

300 N. ZEEB RD., ANN ARBOR, MI 48106 (313) 761-4700

*This brochure accompanies the Pictures of Facial Affect developed by Drs. Paul Ekman and Wallace V. Friesen, Human Interaction Laboratory, University of California Medical Center, San Francisco.*

## Pictures of Facial Affect

For more than fifty years psychologists have explored relationships between facial expression and emotions. What emotions can be judged from viewing a face? How reliable are such judgments? How much does context influence judgments of emotion in faces? At what ages can children judge facial expressions of feelings? Do people of different cultures interpret facial expressions differently?

A review of this research can be found in Ekman, Friesen and Ellsworth (1972). Recently studies have addressed questions of personality differences in the ability to judge emotions and the relationship of brain hemisphere laterality to judgments of emotion from faces. Another interest in facial expressions has been to teach the accurate interpretation of the emotions expressed on the face. Allport in 1924 did one of the earliest of such studies. Presently, professionals in a number of fields are seeking to teach skills in interpreting emotions from facial expressions. Recently Ekman and Friesen (1975) published an extensively illustrated text designed to help those wishing to improve their skills in judging emotional reactions from facial expressions.

A major obstacle to all such research and training has been the lack of a comprehensive set of photographs of different people expressing the different emotions, yielding high inter-rater reliability, and widely available in pictures of consistently high technical quality. Frois-Wittman (1930) pioneered a set of photographs still in use. Unfortunately, the pictures are all posed by one person and they lack the quality which modern photographic technology can provide. The more recent Lightfoot Series (Schlosberg, 1954) suffers from the same defects. Both series have many photos that fail to produce satisfactory consensus among subjects in many studies.

The present set of 110 pictures represents a serious attempt to overcome the limitations of earlier efforts. With the aid of the best current technology in lighting and photography, more than a dozen persons were photographed repeatedly while attempting to express one of six emotions. Hundreds

of photographs were studied over a period of several years to obtain a series which yielded consistent agreement among viewers about the emotion being expressed. The result is the *Pictures of Facial Affect*.

### Development of the Pictures

Six frequently-experienced emotions believed to yield characteristic facial expressions were chosen for study. These were: happiness, sadness, fear, anger, disgust, and surprise. Posers were trained to contract or relax different facial muscles associated with various facial expressions. Generally, posers were instructed to activate certain muscles rather than to pose a particular emotion.

From hundreds of photographs, the present set was finally chosen on the basis of empirical studies which measured the consistency of judgments of the various pictures. Photographs which yielded highly consistent judgments and which fit the authors' theory of facial expressions of affect were finally selected for inclusion in the set, which now provides 14 posers for the six emotions (plus one photograph of each poser in a "neutral" expression).

### Reliability Studies

The pictures of each person which the authors thought best represented the expressions of the six emotions were shown to groups of observers. They judged which of six emotion words best described each photograph. There were two variations in the judgment procedure and the norms were calculated differently for the two procedures to provide comparable normative data across all photographs in this set.

**Procedure 1.** Each slide was shown for 10 seconds to small groups of U.S. born college students. The number of male and female observers was approximately equal. The answer sheet provided a choice of six emotions: happy, sad, fear, anger, surprise and disgust. The observers selected the *one* word which best described the emotion expressed in each slide. The percentage of observers judging each of the six emotions was calculated for each slide.

*Copyright © 1976 by Paul Ekman. All photographs, transparencies, and written material in this series are protected by copyright and may not be reproduced in any form by any process without specific written authorization of Consulting Psychologists Press, Inc.*

**Procedure 2.** Each slide was shown for 10 seconds to small groups of U.S. born college students. Again the number of male and female observers was approximately equal. The answer sheet listed the same six emotion words, but each emotion word was presented on a seven point scale, with neutral or no emotion at one end, and the intended emotion at the other. The observers rated every slide on each of the six emotion scales, i.e. they could rate a slide as showing maximum happiness and neutral on all other scales, or maximum on all six emotions, or some degree between the extremes.

To convert these data to a format comparable to the first procedure, each observer's ratings were reduced to a single judgment for each slide, i.e. the emotion to which he gave the highest rating. If he gave the same intensity rating to more than one emotion, or there was not a difference of at least two points between his ratings of two emotions expressed in a picture, his data were deleted from the analysis for that slide. This procedure required deleting the data from less than 5 per cent of the observers.)

Procedure 2 was used in only one experiment. It is the only data source where observers could give "neutral" as a judgment choice (by circling the zero-point on all six emotion scales.)

The following table summarizes the results of these studies. All photographs in the present set were judged to show the intended emotion by at least 70 per cent of the observers. All but 11 were correctly rated more than 80 per cent of the time; 59 were correctly judged by more than 90 per cent of the raters.

Table 1. No. of Photographs Achieving Various Levels of Correct Judgments

| Percent of correct judgments | Happy |   | Sad |   | Fear |   | Anger |    | Surprise |   | Disgust |   |
|------------------------------|-------|---|-----|---|------|---|-------|----|----------|---|---------|---|
|                              | M     | F | M   | F | M    | F | M     | F  | M        | F | M       | F |
| 71-80%                       |       |   | 3   | 1 | 1    | 1 | 2     | 2  | 1        |   | 1       |   |
| 81-90%                       |       |   | 2   | 4 | 2    | 6 | 3     | 1  |          | 2 | 3       | 2 |
| 91-100%                      | 9     | 9 | 3   | 5 | 4    | 1 | 2     | 7  | 5        | 6 | 3       | 6 |
| TOTALS*                      | 9     | 9 | 5   | 9 | 7    | 8 | 7     | 10 | 6        | 8 | 7       | 9 |

\* Photos intended to pose a neutral face (N=14) were not included in this table as some were not used in the experiment which allowed neutral as a choice.

Complete data for each photograph are provided in Tables 2 and 3 at the end of this report. Table 2 is organized by poser, Table 3 by the six emotions expressed (plus "neutral"), but the data are identical in the two tables. The last column (N) showing number of judges appears only in Table 2.

Investigators using the slides may, of course, wish to gather judgment norms using their own instructions, response sheets, exposure times, experimental procedure and subject populations to confirm selection of subsets of pictures, for any particular study.

#### Description of the Set of Slides

The present set of 110 35mm black and white slides are cardboard-mounted and numbered from 1 to 110, as listed in Table 2. Code numbers unique to each slide also appear in the picture with the poser identified by one or two letters. There are 14 different slides for all emotions except sadness (13) and fear (11). With three exceptions\*, there are six male and eight female photographs for each emotion.

#### References

- Allport, F.H. *Social Psychology*. Boston: Houghton Mifflin, 1924.
- Ekman, P. & Friesen, W.V. *Unmasking the Face*. Englewood Cliffs, N.J.: Prentice-Hall, 1975.
- Ekman, P., Friesen, W.V., & Ellsworth, P. *Emotion in the Human Face*. Elmsford, N.Y.: Pergamon Publishing Co., 1972.
- Frois-Wittmann, S. The judgement of facial expression. *Journal of Experimental Psychology*. 1930, 13, 113-151.
- Schlosberg, H. Three dimensions of emotion. *Psychological Review*. 1954, 61, 81-88.

#### Ordering Information

**All orders must be on institutional or corporate purchase orders or must be accompanied by payment in full.**

**Complete Set of Slides, \$100.00 plus \$1.50 first class postage (add sales tax, if applicable). No return privileges are available on purchase of slides.**

**Replacement Slides, \$2.50 each; minimum order, \$10.00. (Must be ordered by slide number plus photo ID). Replacement slides will be sold only to registered owners of complete sets.**

**Unmasking the Face** by Paul Ekman and Wallace V. Friesen.

A lucidly-written volume for the non-professional, this profusely-illustrated book can help the reader improve his ability to identify emotions from facial expressions. 1975. 212 pp. paperback. \$4.50.

\* Anger and fear, 5 males each; Fear, 6 females.



Table 2. Per cent of Judgments of Each Emotion for Each Photograph  
(Asterisk shows intended emotion for each picture)

| Photograph |         |      |     |      |      |      |      |     |     | (Asterisk shows intended emotion for each picture) |         |      |      |      |      |      |     |     |    |
|------------|---------|------|-----|------|------|------|------|-----|-----|--|---------|------|------|------|------|------|-----|-----|----|
| No.        | ID      | Map  | Sad | Fear | Ang  | Sur  | Disg | Neu | N   | Map  | Sad     | Fear | Ang  | Sur  | Disg | Neu  | N   |     |    |
| 1          | A-1-06  | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 31  | 56   | MF-1-02 | 16   | 68   | 3    | 0    | 3    | 31  |     |    |
| 2          | A-2-06  | 0    | 90* | 6    | 3    | 0    | 0    | 0   | 31  | 57   | MO-1-04 | 100* | 0    | 0    | 0    | 0    | 24  |     |    |
| 3          | A-1-14  | 0    | 3   | 0    | 97*  | 0    | 0    | 0   | 31  | 58   | MO-1-30 | 0    | 98*  | 4    | 0    | 0    | 24  |     |    |
| 4          | A-1-24  | 0    | 0   | 3    | 0    | 97*  | 0    | 0   | 31  | 59   | MO-1-23 | 0    | 0    | 88*  | 0    | 13   | 0   | 24  |    |
| 5          | A-1-25  | 1    | 0   | 0    | 0    | 5    | 0    | 93* | 146 | 60   | MO-1-26 | 0    | 0    | 88*  | 8    | 4    | 0   | 24  |    |
| 6          | A-1-02  | 14   | 30  | 11   | 30   | 2    | 13   | 0*  | 141 | 61   | MO-2-11 | 0    | 0    | 0    | 100* | 0    | 0   | 24  |    |
| 7          | C-2-18  | 99*  | 0   | 0    | 1    | 0    | 0    | 0   | 147 | 62   | MO-2-13 | 0    | 0    | 0    | 96*  | 0    | 4   | 24  |    |
| 8          | C-1-18  | 2    | 90* | 5    | 1    | 0    | 2    | 0   | 145 | 63   | MO-1-14 | 0    | 0    | 6    | 3    | 90*  | 0   | 31  |    |
| 9          | C-1-23  | 0    | 0   | 88*  | 13   | 0    | 0    | 0   | 24  | 64   | MO-2-18 | 0    | 0    | 0    | 0    | 100* | 0   | 24  |    |
| 10         | C-2-12  | 3    | 0   | 0    | 14*  | 3    | 19   | 0   | 31  | 65   | MO-1-05 | 26   | 61   | 0    | 3    | 0    | 10  | 0*  | 31 |
| 11         | C-1-10  | 1    | 0   | 5    | 1    | 94*  | 0    | 0   | 147 | 66   | NR-1-06 | 92*  | 0    | 4    | 0    | 4    | 0   | 24  |    |
| 12         | C-1-04  | 1    | 1   | 0    | 2    | 0    | 96*  | 0   | 147 | 67   | NR-2-15 | 0    | 94*  | 0    | 3    | 3    | 0   | 31  |    |
| 13         | C-2-03  | 6    | 35  | 0    | 26   | 0    | 32   | 0*  | 31  | 68   | NR-1-19 | 0    | 10   | 84*  | 0    | 3    | 3   | 31  |    |
| 14         | EM-4-07 | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 32  | 69   | NR-2-07 | 0    | 0    | 0    | 100* | 0    | 0   | 31  |    |
| 15         | EM-4-24 | 0    | 97* | 0    | 0    | 3    | 0    | 0   | 31  | 70   | NR-1-14 | 0    | 0    | 16   | 0    | 81*  | 3   | 31  |    |
| 16         | EM-5-21 | 0    | 0   | 92*  | 0    | 8    | 0    | 0   | 24  | 71   | NR-3-29 | 0    | 0    | 0    | 17   | 0    | 83* | 0   | 24 |
| 17         | EM-5-24 | 0    | 10  | 83*  | 3    | 3    | 0    | 0   | 30  | 72   | NR-1-03 | 17   | 29   | 0    | 13   | 4    | 38  | 0*  | 24 |
| 18         | EM-5-14 | 0    | 0   | 0    | 33*  | 3    | 13   | 0   | 30  | 73   | PE-2-06 | 97*  | 0    | 0    | 0    | 0    | 0   | 3   | 32 |
| 19         | EM-2-11 | 3    | 0   | 0    | 0    | 91*  | 3    | 3   | 32  | 74   | PE-2-12 | 100* | 0    | 0    | 0    | 0    | 0   | 0   | 31 |
| 20         | EM-4-17 | 0    | 0   | 0    | 3    | 0    | 97*  | 0   | 30  | 75   | PE-2-31 | 0    | 74*  | 16   | 3    | 0    | 6   | 0   | 31 |
| 21         | EM-2-04 | 25   | 3   | 3    | 0    | 0    | 0    | 65* | 32  | 76   | PE-5-07 | 0    | 92*  | 8    | 0    | 0    | 0   | 0   | 24 |
| 22         | GS-1-08 | 96*  | 0   | 0    | 0    | 4    | 0    | 0   | 24  | 77   | PE-5-10 | 0    | 83*  | 0    | 4    | 0    | 13  | 0   | 24 |
| 23         | GS-2-01 | 0    | 71* | 3    | 13   | 0    | 13   | 0   | 31  | 78   | PE-3-16 | 0    | 0    | 91*  | 2    | 7    | 0   | 0   | 44 |
| 24         | GS-1-25 | 0    | 0   | 77*  | 0    | 19   | 3    | 0   | 31  | 79   | PE-3-21 | 0    | 0    | 92*  | 4    | 4    | 0   | 0   | 25 |
| 25         | GS-2-08 | 0    | 0   | 4    | 70*  | 0    | 26   | 0   | 23  | 80   | PE-2-21 | 0    | 3    | 0    | 83*  | 7    | 7   | 0   | 30 |
| 26         | GS-1-16 | 0    | 0   | 0    | 0    | 100* | 0    | 0   | 24  | 81   | PE-6-02 | 0    | 0    | 2    | 0    | 74*  | 3   | 0   | 31 |
| 27         | GS-2-25 | 0    | 3   | 0    | 13   | 0    | 24*  | 0   | 31  | 82   | PE-4-05 | 0    | 0    | 0    | 10   | 0    | 90* | 0   | 31 |
| 28         | GS-1-04 | 15   | 21  | 0    | 21   | 4    | 42   | 0*  | 24  | 83   | PE-2-04 | 16   | 16   | 3    | 0    | 3    | 0   | 63* | 32 |
| 29         | JB-1-09 | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 32  | 84   | PF-1-05 | 96*  | 0    | 0    | 0    | 4    | 0   | 0   | 24 |
| 30         | JB-1-23 | 0    | 7   | 0    | 81*  | 0    | 11   | 0   | 27  | 85   | PF-1-06 | 100* | 0    | 0    | 0    | 0    | 0   | 0   | 31 |
| 31         | JB-1-12 | 0    | 3   | 3    | 0    | 93*  | 0    | 0   | 29  | 86   | PF-2-12 | 0    | 100* | 0    | 0    | 0    | 0   | 0   | 24 |
| 32         | JB-1-16 | 0    | 0   | 0    | 0    | 0    | 100* | 0   | 30  | 87   | PF-2-16 | 0    | 100* | 0    | 0    | 0    | 0   | 0   | 31 |
| 33         | JB-1-03 | 0    | 13  | 3    | 3    | 0    | 3    | 78* | 32  | 88   | PF-2-30 | 0    | 0    | 100* | 0    | 0    | 0   | 0   | 31 |
| 34         | JJ-4-07 | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 31  | 89   | PF-2-04 | 0    | 0    | 0    | 79*  | 0    | 21  | 0   | 24 |
| 35         | JJ-4-08 | 97*  | 0   | 0    | 0    | 3    | 0    | 0   | 31  | 90   | PF-1-16 | 7    | 0    | 0    | 0    | 93*  | 0   | 0   | 30 |
| 36         | JJ-5-05 | 3    | 95* | 0    | 3    | 0    | 0    | 0   | 30  | 91   | PF-1-24 | 4    | 0    | 0    | 0    | 0    | 96* | 0   | 24 |
| 37         | JJ-5-13 | 0    | 4   | 96*  | 0    | 0    | 0    | 0   | 25  | 92   | PF-1-02 | 47   | 30   | 7    | 3    | 7    | 7   | 0*  | 30 |
| 38         | JJ-3-12 | 0    | 0   | 15   | 76*  | 3    | 6    | 0   | 33  | 93   | SW-3-09 | 100* | 0    | 0    | 0    | 0    | 0   | 0   | 24 |
| 39         | JJ-4-13 | 0    | 0   | 3    | 0    | 97*  | 0    | 0   | 30  | 94   | SW-2-16 | 0    | 92*  | 0    | 0    | 0    | 8   | 0   | 24 |
| 40         | JJ-3-20 | 0    | 12  | 0    | 0    | 0    | 88*  | 0   | 33  | 95   | SW-2-30 | 4    | 0    | 79*  | 0    | 8    | 8   | 0   | 24 |
| 41         | JJ-3-04 | 17   | 47  | 0    | 17   | 0    | 20   | 0*  | 30  | 96   | SW-4-09 | 0    | 0    | 0    | 100* | 0    | 0   | 0   | 30 |
| 42         | JM-1-04 | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 24  | 97   | SW-1-16 | 0    | 0    | 0    | 0    | 100* | 0   | 0   | 31 |
| 43         | JM-3-11 | 0    | 36* | 0    | 0    | 0    | 4    | 0   | 23  | 98   | SW-1-30 | 0    | 0    | 0    | 6    | 0    | 94* | 0   | 31 |
| 44         | JM-5-03 | 0    | 4   | 4    | 92*  | 0    | 0    | 0   | 24  | 99   | SW-3-03 | 25   | 46   | 0    | 0    | 0    | 29  | 0*  | 24 |
| 45         | JM-1-16 | 0    | 0   | 4    | 0    | 56*  | 0    | 0   | 24  | 100  | WF-2-11 | 97*  | 0    | 0    | 0    | 0    | 3   | 0   | 32 |
| 46         | JM-2-08 | 0    | 0   | 0    | 3    | 0    | 97*  | 0   | 31  | 101  | WF-2-12 | 100* | 0    | 0    | 0    | 0    | 9   | 0   | 31 |
| 47         | JM-1-09 | 63   | 21  | 8    | 0    | 0    | 8    | 0*  | 24  | 102  | WF-3-28 | 7    | 79*  | 0    | 3    | 3    | 7   | 0   | 29 |
| 48         | MF-1-06 | 100* | 0   | 0    | 0    | 0    | 0    | 0   | 31  | 103  | WF-5-06 | 0    | 88*  | 0    | 4    | 0    | 8   | 0   | 24 |
| 49         | MF-1-30 | 0    | 90* | 3    | 0    | 0    | 6    | 0   | 31  | 104  | WF-3-16 | 0    | 4    | 88*  | 0    | 4    | 4   | 0   | 25 |
| 50         | MF-1-26 | 0    | 4   | 88*  | 0    | 8    | 0    | 0   | 24  | 105  | WF-3-01 | 0    | 0    | 0    | 100* | 0    | 0   | 0   | 30 |
| 51         | MF-1-27 | 0    | 0   | 83*  | 0    | 17   | 0    | 0   | 24  | 106  | WF-3-04 | 0    | 0    | 2    | 96*  | 0    | 2   | 0   | 45 |
| 52         | MF-2-05 | 0    | 3   | 3    | 84*  | 6    | 3    | 0   | 31  | 107  | WF-2-16 | 0    | 0    | 9    | 0    | 91*  | 0   | 0   | 69 |
| 53         | MF-2-07 | 0    | 0   | 0    | 100* | 0    | 0    | 0   | 24  | 108  | WF-3-11 | 0    | 0    | 0    | 3    | 0    | 97* | 0   | 29 |
| 54         | MF-1-09 | 0    | 0   | 0    | 0    | 96*  | 4    | 0   | 24  | 109  | WF-4-22 | 0    | 0    | 0    | 20   | 0    | 80* | 0   | 30 |
| 55         | MF-2-13 | 0    | 0   | 0    | 10   | 0    | 90*  | 0   | 30  | 110  | WF-2-05 | 0    | 7    | 0    | 28   | 0    | 7   | 59* | 29 |

In all cases where a zero appears in this column for a photo intended as neutral, neutral was not an available choice in the study (see text).

In all cases where a zero appears in this column for a photo intended as neutral, neutral was not an available choice in the study (see text).

| Photograph No.                | ID      | Hap | Sad | Fear | Ang | Sur | Disg | Neu* |
|-------------------------------|---------|-----|-----|------|-----|-----|------|------|
| <b>Happy Photos</b>           |         |     |     |      |     |     |      |      |
| 1                             | A-1-06  | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 7                             | C-2-18  | 99  | 0   | 0    | 1   | 0   | 0    | -    |
| 14                            | EM-4-07 | 100 | 0   | 0    | 0   | 0   | 0    | 0    |
| 22                            | GS-1-08 | 96  | 0   | 0    | 0   | 4   | 0    | -    |
| 29                            | JB-1-09 | 100 | 0   | 0    | 0   | 0   | 0    | 0    |
| 34                            | JJ-4-07 | 100 | 0   | 0    | 0   | 0   | 0    | 0    |
| 35                            | JJ-4-08 | 97  | 0   | 0    | 0   | 3   | 0    | 0    |
| 42                            | JM-1-04 | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 48                            | MF-1-06 | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 57                            | MO-1-04 | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 56                            | NR-1-06 | 92  | 0   | 4    | 0   | 4   | 0    | -    |
| 73                            | PE-2-06 | 97  | 0   | 0    | 0   | 0   | 0    | 3    |
| 74                            | PE-2-12 | 100 | 0   | 0    | 0   | 0   | 0    | 0    |
| 84                            | PF-1-05 | 96  | 0   | 0    | 0   | 4   | 0    | -    |
| 95                            | PF-1-06 | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 93                            | SW-3-09 | 100 | 0   | 0    | 0   | 0   | 0    | -    |
| 100                           | WF-2-11 | 97  | 0   | 0    | 0   | 0   | 3    | 0    |
| 101                           | WF-2-12 | 100 | 0   | 0    | 0   | 0   | 0    | 0    |
| <b>Sad Photos</b>             |         |     |     |      |     |     |      |      |
| 2                             | A-2-06  | 0   | 90  | 6    | 3   | 0   | 0    | -    |
| 8                             | C-1-18  | 2   | 90  | 5    | 1   | 0   | 2    | -    |
| 15                            | EM-4-24 | 0   | 97  | 0    | 0   | 3   | 0    | 0    |
| 23                            | GS-2-01 | 0   | 71  | 3    | 13  | 0   | 13   | -    |
| 36                            | JJ-5-05 | 3   | 93  | 0    | 3   | 0   | 0    | 0    |
| 43                            | JM-3-11 | 0   | 96  | 0    | 0   | 0   | 4    | -    |
| 49                            | MF-1-30 | 0   | 90  | 3    | 0   | 0   | 6    | -    |
| 58                            | MO-1-30 | 0   | 87  | 4    | 0   | 0   | 9    | -    |
| 67                            | NR-2-15 | 0   | 94  | 0    | 3   | 3   | 0    | -    |
| 75                            | PE-2-31 | 0   | 74  | 16   | 3   | 0   | 6    | -    |
| 76                            | PE-5-07 | 0   | 92  | 8    | 0   | 0   | 0    | -    |
| 77                            | PE-5-10 | 0   | 83  | 0    | 4   | 0   | 13   | -    |
| 86                            | PF-2-12 | 0   | 100 | 0    | 0   | 0   | 0    | -    |
| 87                            | PF-2-16 | 0   | 100 | 0    | 0   | 0   | 0    | -    |
| 94                            | SW-2-16 | 0   | 92  | 0    | 0   | 0   | 8    | -    |
| 102                           | WF-3-28 | 7   | 79  | 0    | 3   | 3   | 7    | 0    |
| 103                           | WF-5-06 | 0   | 38  | 0    | 4   | 0   | 9    | -    |
| <b>Fear Photos</b>            |         |     |     |      |     |     |      |      |
| 9                             | C-1-23  | 0   | 0   | 87   | 13  | 0   | 0    | -    |
| 16                            | EM-5-21 | 0   | 0   | 92   | 0   | 3   | 3    | -    |
| 17                            | EM-5-24 | 0   | 10  | 83   | 3   | 3   | 0    | -    |
| 24                            | GS-1-25 | 0   | 0   | 77   | 0   | 19  | 3    | -    |
| 37                            | JJ-5-13 | 0   | 4   | 96   | 0   | 0   | 0    | 0    |
| 50                            | MF-1-26 | 0   | 4   | 87   | 0   | 8   | 0    | -    |
| 51                            | MF-1-27 | 0   | 0   | 83   | 0   | 17  | 0    | -    |
| 59                            | MO-1-23 | 0   | 0   | 88   | 0   | 13  | 0    | -    |
| 60                            | MO-1-26 | 0   | 0   | 88   | 8   | 4   | 0    | -    |
| 58                            | NR-1-19 | 0   | 10  | 84   | 0   | 3   | 3    | -    |
| 78                            | PE-3-16 | 0   | 0   | 91   | 2   | 7   | 0    | -    |
| 79                            | PE-3-21 | 0   | 0   | 92   | 4   | 4   | 0    | 0    |
| 88                            | PF-2-30 | 0   | 0   | 100  | 0   | 0   | 0    | -    |
| 95                            | SW-2-30 | 4   | 0   | 79   | 0   | 8   | 8    | -    |
| 104                           | WF-3-16 | 0   | 4   | 88   | 0   | 4   | 4    | 0    |
| <b>Anger Photos</b>           |         |     |     |      |     |     |      |      |
| 3                             | A-1-14  | 0   | 3   | 0    | 97  | 0   | 0    | -    |
| 10                            | C-2-12  | 3   | 0   | 0    | 74  | 3   | 19   | -    |
| 18                            | EM-5-14 | 0   | 0   | 0    | 83  | 3   | 13   | -    |
| 25                            | GS-2-08 | 0   | 0   | 4    | 70  | 0   | 26   | -    |
| 30                            | JB-1-23 | 0   | 7   | 0    | 81  | 0   | 11   | 0    |
| <b>Anger Photos (Cont'd.)</b> |         |     |     |      |     |     |      |      |
| 38                            | JJ-3-12 | 0   | 0   | 15   | 76  | 3   | 6    | -    |
| 44                            | JM-5-03 | 0   | 4   | 4    | 92  | 0   | 0    | -    |
| 52                            | MF-2-05 | 0   | 3   | 3    | 24  | 6   | 3    | -    |
| 53                            | MF-2-07 | 0   | 0   | 0    | 100 | 0   | 0    | -    |
| 61                            | MO-2-11 | 0   | 0   | 0    | 100 | 0   | 0    | -    |
| 62                            | MO-2-13 | 0   | 0   | 0    | 96  | 0   | 4    | -    |
| 69                            | NR-2-07 | 0   | 0   | 0    | 100 | 0   | 0    | -    |
| 80                            | PE-2-21 | 0   | 3   | 0    | 83  | 7   | 7    | 0    |
| 89                            | PF-2-04 | 0   | 0   | 0    | 79  | 0   | 21   | -    |
| 96                            | SW-4-09 | 0   | 0   | 0    | 100 | 0   | 0    | -    |
| 105                           | WF-3-01 | 0   | 0   | 0    | 100 | 0   | 0    | 0    |
| 106                           | WF-3-04 | 0   | 0   | 2    | 96  | 0   | 2    | -    |
| <b>Surprise Photos</b>        |         |     |     |      |     |     |      |      |
| 4                             | A-1-24  | 0   | 0   | 3    | 0   | 97  | 0    | -    |
| 11                            | C-1-10  | 1   | 0   | 5    | 1   | 94  | 0    | -    |
| 19                            | EM-2-11 | 3   | 0   | 0    | 0   | 91  | 3    | 3    |
| 26                            | GS-1-16 | 0   | 0   | 0    | 0   | 100 | 0    | -    |
| 31                            | JB-1-12 | 0   | 3   | 3    | 0   | 93  | 0    | 0    |
| 39                            | JJ-4-13 | 0   | 0   | 3    | 0   | 97  | 0    | 0    |
| 45                            | JM-1-16 | 0   | 0   | 4    | 0   | 96  | 0    | -    |
| 54                            | MF-1-09 | 0   | 0   | 0    | 0   | 96  | 4    | -    |
| 63                            | MO-1-14 | 0   | 0   | 6    | 3   | 90  | 0    | -    |
| 70                            | NR-1-14 | 0   | 0   | 16   | 0   | 81  | 3    | -    |
| 81                            | PE-6-02 | 0   | 0   | 23   | 0   | 74  | 3    | -    |
| 90                            | PF-1-16 | 7   | 0   | 0    | 0   | 93  | 0    | -    |
| 97                            | SW-1-16 | 0   | 0   | 0    | 0   | 100 | 0    | -    |
| 107                           | WF-2-16 | 0   | 0   | 9    | 0   | 91  | 0    | -    |
| <b>Disgust Photos</b>         |         |     |     |      |     |     |      |      |
| 5                             | A-1-25  | 1   | 0   | 0    | 6   | 0   | 93   | -    |
| 12                            | C-1-04  | 1   | 1   | 0    | 2   | 0   | 96   | -    |
| 20                            | EM-4-17 | 0   | 0   | 0    | 3   | 0   | 97   | 0    |
| 27                            | GS-2-25 | 0   | 3   | 0    | 13  | 0   | 84   | -    |
| 32                            | JB-1-16 | 0   | 0   | 0    | 2   | 0   | 100  | 0    |
| 40                            | JJ-3-20 | 0   | 12  | 0    | 0   | 0   | 88   | -    |
| 46                            | JM-2-08 | 0   | 0   | 0    | 3   | 0   | 97   | -    |
| 55                            | MF-2-13 | 0   | 0   | 0    | 10  | 0   | 90   | -    |
| 64                            | MO-2-18 | 0   | 0   | 0    | 0   | 0   | 100  | -    |
| 71                            | NR-3-29 | 0   | 0   | 0    | 17  | 0   | 83   | -    |
| 32                            | PE-4-05 | 0   | 0   | 0    | 10  | 0   | 90   | 0    |
| 91                            | PF-1-24 | 4   | 0   | 0    | 0   | 0   | 96   | -    |
| 98                            | SW-1-30 | 0   | 0   | 0    | 6   | 0   | 94   | -    |
| 108                           | WF-3-11 | 0   | 0   | 0    | 3   | 0   | 97   | 0    |
| 109                           | WF-4-22 | 0   | 0   | 0    | 20  | 0   | 80   | -    |
| <b>Neutral Photos</b>         |         |     |     |      |     |     |      |      |
| 6                             | A-1-02  | 14  | 30  | 11   | 30  | 2   | 13   | -    |
| 13                            | C-2-03  | 6   | 35  | 0    | 26  | 0   | 32   | -    |
| 21                            | EM-2-04 | 25  | 3   | 3    | 0   | 0   | 69   | -    |
| 28                            | GS-1-04 | 13  | 21  | 0    | 21  | 4   | 42   | -    |
| 33                            | JB-1-03 | 0   | 13  | 3    | 3   | 0   | 3    | 78   |
| 41                            | JJ-3-04 | 17  | 47  | 0    | 17  | 0   | 20   | -    |
| 47                            | JM-1-09 | 63  | 21  | 8    | 0   | 0   | 8    | -    |
| 56                            | MF-1-02 | 16  | 68  | 3    | 0   | 3   | 10   | -    |
| 65                            | MO-1-05 | 26  | 61  | 0    | 3   | 0   | 10   | -    |
| 72                            | NR-1-03 | 17  | 29  | 0    | 13  | 4   | 38   | -    |
| 83                            | PE-2-04 | 16  | 16  | 3    | 0   | 3   | 0    | 63   |
| 92                            | PF-1-02 | 47  | 30  | 7    | 3   | 7   | 7    | -    |
| 99                            | SW-3-03 | 25  | 46  | 0    | 0   | 0   | 29   | -    |
| 110                           | WF-2-05 | 0   | 7   | 0    | 28  | 0   | 7    | 59   |

\* Where a dash appears in the Neutral column, the judges did not have "Neutral" as an alternative choice in the study (see text).

APPENDIX E  
LIST OF PICTURES OF FACIAL  
AFFECT SLIDES USED

## LIST OF PICTURES OF FACIAL AFFECT SLIDES USED

| No. | ID      | No. | ID      |
|-----|---------|-----|---------|
| 1   | A-1-06  | 27  | GS-2-25 |
| 7   | C-2-18  | 28  | GS-1-04 |
| 9   | C-1-23  | 29  | JB-1-09 |
| 10  | C-2-12  | 36  | JJ-5-05 |
| 14  | EM-4-07 | 37  | JJ-5-13 |
| 15  | EM-4-24 | 42  | JM-1-04 |
| 16  | EM-5-21 | 44  | JM-5-03 |
| 18  | EM-5-14 | 45  | JM-L-16 |
| 19  | EM-2-11 | 47  | JM-1-09 |
| 20  | EM-4-17 | 48  | MF-2-13 |
| 22  | GS-1-08 | 55  | MF-2-13 |
| 24  | GS-1-25 | 58  | MO-1-30 |
| 25  | GS-2-03 | 64  | MO-2-18 |
| 26  | GS-1-16 | 73  | PE-2-06 |
|     |         | 90  | PF-1-24 |

## RANDOM SLIDE ORDERING

## Perception of Emotion

7  
10  
58  
37  
15  
44  
19  
45  
20  
55  
9  
16  
24  
36  
26  
25  
27  
1  
8  
14  
90  
64  
22  
8

## Attribution of Acceptance

29  
42  
97  
48  
73

APPENDIX F

LIKERT TYPE SCALE:

PERCEPTION OF EMOTION:

## Oral Instructions

I am going to show you some slides of faces and I want you to tell me which emotions the faces show (pointing to list). Also, tell me how much emotion (like happiness) that the face is showing from none to a whole lot (pointing to scale). Be sure to remember that the scales alternate.\*

Do you know what:

Happy

Sad

Anger

Surprise

Disgust

Fear

means, and how the face would look?

---

Now I am going to show you some more slides. Based upon how the person looks, I want you to answer the listed questions. Be sure to remember that the scales alternate.\*

\*If the child was a nonreader or appeared to be unsure of the task, each set of emotions and the scale was read to him, as well as the list of questions.

## Likert Type Scale for Perception of Emotions\*

Slide  
No.

|          |              |                   |                   |                   |                   |
|----------|--------------|-------------------|-------------------|-------------------|-------------------|
| Fear     |              |                   |                   |                   |                   |
| Happy    |              |                   |                   |                   |                   |
| Surprise |              |                   |                   |                   |                   |
| Disgust  | <u>a lot</u> | <u>          </u> | <u>          </u> | <u>          </u> | <u>          </u> |
| Sad      |              |                   |                   |                   |                   |
| Anger    |              |                   |                   |                   |                   |

\* The actual scoring sheet consisted of 24 sets of the above scale. Placement of name of emotion in each set was randomized. In addition, the 24 sets of the above scale were randomly ordered in 5 different scoring sheets.



APPENDIX G

LIKERT TYPE SCALE:

ATTRIBUTION OF ACCEPTANCE

## Likert Type Scale for Attribution of Acceptance\*

Slide

No.

1. Does this person want to:

Eat a meal with me?

Like me?

Talk with me?

Play a game with me?

Listen to me?

very much

some

not at all

\* The actual scoring sheet consisted of 5 sets of the above scale. Placement of listed questions in each set was randomized. In addition, the 5 sets of the above scale were randomly ordered in 5 different scoring sheets.