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ENCODING AND DECODING FACIAL EXPRESSIONS OF EMOTION
AS A FUNCTION OF CHILDREN'S SOCIAL COMPETENCE

A Thesis Presented

By

ROBERT JOSEPH CISTRINI

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Psychology

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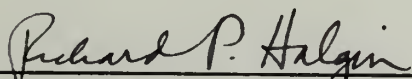
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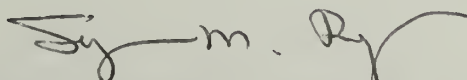
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CHAPTER I

Introduction

Over the past two decades, a substantial body of evidence has been amassed pointing to the importance of facial expressions as a means of communicating and obtaining information about one's immediate social environment (e.g., Blau, Buck & Rosenthal, 1986; Ekman, 1982; Fridlund, Ekman & Oster, 1987). Such expressions provide valuable cues as to the qualitative meaning of interpersonal exchanges, information that might otherwise be disguised or hidden by the verbal content of communications. In fact, there is evidence to suggest that facial expressions are, in some instances, more effective than either verbal or contextual cues in revealing an individual's internal affective state (Ekman, Friesen, & Ellsworth, 1982).

Charles Darwin (1872) was among the first to propose the idea of a universally-recognized set of facial expressions among humans, noting that, "The movements of expression give vividness and energy to our spoken words. They reveal the thoughts and intentions of others more truly than do words, which may be falsified" (p. 364). Darwin believed that facial expressions evolved as a mechanism to facilitate social communication both within

and between species. And although many took issue with the notion of a biological as opposed to a sociocultural basis for human facial expressiveness, the work of later researchers has confirmed that Darwin was indeed correct.

Studies of Facial Expressiveness Among Children and Adults

Early cross-cultural studies

In his discussion of cross-cultural research in the area of human facial expressiveness, Ekman (1973) noted that "the only way to establish conclusively the existence of universal facial expressions of emotion was to show that visually isolated people interpret facial expressions in the same way as people from literate cultures" (p. 210). In a series of classic studies completed in the late 1960's (Ekman & Friesen, 1971), he did just that. The subjects were individuals from an isolated culture in New Guinea who had had little or no contact with the outside world since being discovered several years earlier. Each was told a series of short stories (e.g., "His friends have come and he is happy") and presented with three pictures identified in previous "literate culture" studies as representing anger, disgust, fear, happiness, sadness or surprise. They were then asked to identify the picture that was most appropriate to the story. Results showed that the faces chosen were the same as those selected in other cultures. In a second experiment, different subjects from the same

New Guinea culture were read a series of similar vignettes and asked to show how they would feel if they were the person in the story. They were videotaped and their posed expressions shown to a group of college students in the United States; Ekman and Friesen reported that the students had little difficulty identifying most of the emotions expressed by the New Guineans.

In a study looking at the universality of spontaneously encoded emotions, Ekman, Friesen, and Malmstrom (1970; described in Ekman, Friesen, & Ellsworth, 1972) showed a stress-inducing film to American and Japanese college students. The subjects' reactions to the film were videotaped under two conditions--alone, and while discussing the experience with another individual from their own culture. The authors found that when alone, both American and Japanese subjects displayed (encoded) expressions that were virtually identical; however, in the presence of a peer, Japanese subjects tended to mask their emotions much more than their American counterparts, suggesting that facially expressed reactions to certain primary (and in this case, negative) emotions are similar, but that cultures differ in the variety and strength of emotion that members are encouraged to openly express.

Lending additional support to Darwin's evolutionary theory are the results of numerous other experiments by Ekman, Izard and others, examining the production and

recognition of facial expressions among people from 14 countries on five continents. (For a review, see Fridlund, Ekman & Oster, 1987.) Taken as a whole, these studies substantiate the existence of at least five (and probably more) universally-recognized categories of facial expression: happiness, sadness, anger, disgust and combined fear/surprise.

Developmental patterns in the ability to decode and encode emotions

Investigators have also attempted to identify a typical course of development in the ability to recognize (decode) and produce (encode) each of the primary emotions, and the evidence available suggests that these skills are fairly well established even at an early age. Buck (1975) looked at the encoding ability of a group of pre-schoolers by showing them a group of slides (with pleasant, neutral and unpleasant content) and having raters observe them through the use of a hidden camera. The author found large differences in "sending ability" between children but also noted a significant overall level of communication, indicating that most children were able to accurately convey at least some information about their affective state while viewing the slides.

One of the first studies to compare the encoding and decoding skills of different-aged children was conducted by

Odom and Lemond (1972). In it, kindergarten and fifth grade students were individually exposed to one of two types of stimuli: a standardized series of 32 black-and-white photographs of human faces (Izard, 1971), and a verbally-presented list of situational items such as "being chased by a mean dog" or "finding a smashed bug in your milk." In the encoding procedure, subjects were asked to imitate the people in the photographs or to make a face showing how they would feel in the situations described to them. The decoding procedure required the subject to match photographs expressing the same emotional state or identifying photographs showing how a person in each of the verbally-presented situations might feel. Eight emotional categories were used--anger, disgust, distress, fear, interest, joy, shame and surprise--and results showed that the fifth graders were significantly better at both encoding and decoding than their kindergarten counterparts; this was true for all categories except joy, which was encoded with approximately the same accuracy in both groups. Fear proved to be extremely difficult for the younger group to encode. The authors also reported a lag in the development of encoding skills in six of the eight emotional categories studied, and suggested that encoding of certain emotions may be inhibited by socialization factors.

Yarczower, Kilbride, and Hill (1979) looked at the imitative encoding abilities of first graders, sixth graders, and college students--both alone and in the presence of an experimenter. They found that the sixth graders performed significantly better than the first graders, both overall and in the experimenter-absent condition. However, in the presence of an experimenter, their encoding accuracy did not differ noticeably from the first graders. Moreover, in a study focusing on both encoding and decoding abilities, Moyer (1974) compared third graders and kindergarteners and found the older children to be significantly more skilled in both areas.

Numerous other investigations have looked at developmental patterns as they relate to sex of subject, decodability of peers versus adults, and chronological differences in the production and recognition of specific categories of emotion. Among pre-school aged children, both sexes appear equally capable of encoding facial expressions (Buck, 1975), but studies with adult subjects do indicate a gender difference, with females showing greater skill than males (e.g., Buck, Miller, & Caul, 1974). As Izard (1971) suggests, this may be due to cultural values that discourage males from openly expressing their emotions. No reports citing sex differences in the ability to decode facial expressions were located.

In contrast to the literature on sex differences in the development of a nonverbal repertoire, significant effects due to category of emotion have been demonstrated repeatedly, with happiness and sadness proving to be the easiest to recognize and produce; anger and disgust being somewhat more difficult; and fear/surprise being the most troublesome for children and adults alike (e.g., Field & Walden, 1982; Walden & Field, 1982; Kirouac & Doré, 1983). The results of these studies suggest a developmental pattern in the acquisition and nonverbal use of specific emotional expressions, with the simplest acquired early and the more difficult categories appearing later on as the child's nonverbal communicative skills become more sophisticated. In their review of the literature through the mid 1980's, Fridlund, Ekman and Oster (1987) suggested that the production and recognition of facial expressions seems to improve until about age 10, at which time children and adults appear equally capable of encoding and decoding all major categories of emotion.

In some experiments looking at children's decoding abilities, attempts have also been made to determine whether peer and adult stimuli are equivalent; i.e., do adults and children encode emotions in essentially the same manner? The evidence thus far is inconclusive. Masters, Felleman, Barden, Carlson, and Rosenberg (1983) report that 4- and 5-year-old subjects were better able to recognize

the facial expressions of peers as opposed to adults. However, a group of 8- to 11-year-olds tested by Edwards, Manstead, and MacDonald (1984) found stimuli using adult (as opposed to children's) faces easier to decode. Finally, Kirouac, Tremblay and Doré (1986) found no difference in the decodability of adult versus child faces by 5- to 9-year-olds.

Social competence and its relation to children's nonverbal decoding ability

From the research described above, it is clear that nonverbal channels of communication--and facial expressions in particular--play an important role in helping us to understand and respond to those around us. Such forms of communication comprise an integral component of general social competence (i.e., the ability to function effectively in interpersonal situations). We have also seen that the ability to encode and decode facial expressions is a developmental process, with mastery of the most complex emotional expressions normally attained sometime before the onset of adolescence. Therefore it would seem a reasonable hypothesis to assume that individuals with recognizable deficits in interpersonal skills might not have reached the same level of development in the nonverbal realm as have their more successful peers.

Supporting this hypothesis is a study by Zabel (1979) that compared groups of elementary- and junior high-aged students from both regular schools and "special" schools for children with emotional and behavior problems judged "too severe to be accommodated or remediated in regular schools." In an emotion recognition task, subjects (aged 7 to 15) were individually presented with a series of 42 photographs selected from Ekman and Friesen's Pictures of Facial Affect (Ekman, 1976). They were given detailed instructions and asked to choose one of six emotion labels (anger, disgust, fear, happiness, sadness, surprise) for each photo presented. To be sure the subjects understood what they were to do, examples were given for each category such as: "A person who is having fun would probably be happy" or "Someone who is going to throw away a rotten egg, but drops it and it smells really bad, would probably be disgusted." Zabel found the disturbed groups to be less adept both for overall decoding ability and for several individual emotions.

In another study by Walker (1981), groups of schizophrenic, anxious-depressed, unsocialized-aggressive and "typical" control children (aged 9 to 13) were administered Izard's (1971) Cross-Cultural Test of Emotion Recognition. The test consists of 32 photographs of adult male and female faces, each depicting one of eight emotions--anger, disgust, fear, interest, joy, sadness,

shame or surprise--with four photos for each category. Eight index cards printed with a commonly recognized name for each emotion were placed in front of the subject who was then asked to match one of the labels to each photograph as it was presented. Results showed that children diagnosed as schizophrenic were significantly less proficient at decoding than the other three groups. Differences between the control group and the other two experimental groups were not statistically significant.

Walker suggested that the poor performance of the schizophrenic children is best explained by the fact that they exhibited greater social impairment than either the control or the less severely disturbed groups, but also noted that it is unclear if such decoding deficits precede social withdrawal or if they are a result of the process. Additional evidence for a possible causal connection between the ability to recognize and produce facial expressions of emotion and subsequent social withdrawal was provided by Buck (1975), who found encoding ability to be positively correlated with aggression, sociability, and bossiness, and negatively correlated with shyness and inhibition.

In a more recent investigation aimed at identifying differences in decoding accuracy between socially withdrawn children and those who were more popular with their peers, Edwards, Manstead, and MacDonald (1984) used a self-report

scale asking groups of children (aged 8 to 11) how friendly they were with each of their classmates, and selected those children scoring highest and lowest on this measure for assignment to one of two experimental groups. Subjects were shown a series of photographs depicting adults (taken from Ekman & Friesen, 1975) or children (taken from Odom & Lemond, 1972) demonstrating facial expressions of six emotions: anger, disgust, fear, happiness, sadness and surprise. The pictures were presented one at a time in the company of a list of emotional categories which was both read and displayed, and the subject was asked to indicate the emotion being portrayed by each. The authors found a significant main effect due to sociometric status, with the popular children demonstrating greater skill in identifying emotional expressions than their less socially successful peers. Lending support to this finding are studies by Christenson, Farina, and Boudreau (1980) and Feldman, White, and Lobato (1982) which found the ability to attach meaning to the nonverbal cues of others to be an important component in successful social functioning among female undergraduates and adolescents respectively.

The Present Study

The previous studies strongly suggest a relationship between the recognition of facial expressions and interpersonal and social effectiveness. Yet one drawback

present in each of these investigations is the use of posed rather than spontaneous, naturally-occurring facial expressions as stimuli for their decoding tasks. Moreover, the investigators focused only on the ability of various groups of children to decode expressions, and in doing so have ignored a question of obvious importance: Given the fact that these socially withdrawn children show a deficit in the ability to understand the nonverbal cues of others, are they also less accurate in encoding their own feelings?

In the present study, groups of children demonstrating above and below average levels of social competence were compared on their accuracy in both decoding and encoding various facial expressions of emotion. A series of videotaped film clips (each tested and shown to reliably evoke a specific type of reaction) were used to assess each subject's spontaneous encoding accuracy, and scenes of others reacting to the same clips were used to measure their skill in decoding naturally-occurring facial expressions of emotion. The following questions were of primary interest:

1. Are children with below average levels of social competence actually less accurate in decoding the facial expressions of others? If so, are they also less accurate in encoding various affective states?

2. Is encoding and decoding accuracy in children positively correlated with social competence or could it in

fact inhibit an individual's ability to interact effectively with others?

3. Finally, does a child's gender play a significant role in determining his or her encoding and decoding accuracy?

C H A P T E R I I

Method

Subjects

Thirty-three subjects, aged 9 to 12, were recruited from the classrooms of two public elementary schools in a small New England town. Recruitment was achieved through the use of informational packets mailed to the parents of all children in grades 4 through 6. Each packet included a letter describing the study (Appendix C), a campus map describing the location of the experiment, a subject interest form on which parents indicated their willingness to have their child participate in the study (Appendix D), and a postage-paid return envelope. Approximately 30% of the families solicited expressed an interest in taking part in the study. Upon receipt of the subject interest form, parents were contacted by phone and an appointment arranged for them to come to the University. Families were paid for their participation.

Materials

Stimuli

Approximately 50 motion picture film clips, each two to three minutes in length, were selected for initial evaluation and pilot testing. Each was chosen for its

anticipated effectiveness in evoking one of five types of emotions: anger, disgust, fear/surprise, happiness or sadness. The clips were recorded in a randomized order and divided into overlapping groups, each containing six or seven film segments. Undergraduate students were then presented with a specific group of clips and asked to rate the nature (category of emotion) and strength (on a seven-point Likert-type scale) of their reactions to each. They were also asked to note those aspects of the clips that were most responsible for their reaction (see Appendix B). Each clip was evaluated by a minimum of 20 undergraduates, and those that proved most effective in eliciting the desired emotional responses were then rated (for category of emotion only) by a group of 11 boys, aged 8 to 12.

Ten clips (two for each category of emotion) were selected as stimuli for the encoding task in the current experiment. They were chosen for their relative purity (i.e., their effectiveness in evoking a single category of emotion) and their ability to elicit moderate levels of arousal in those who viewed them. "Fear/surprise" and "disgust" scenes judged as extremely arousing by undergraduate raters were not shown to child raters. Overall interrater agreement for the clips selected ranged from 87 to 98 percent; for specific age and gender groups, the range was 85 to 100 percent.

Decoding stimuli consisted of a set of 20 viewer reaction sequences showing adults reacting to the film clips described above. Four encoders (two males and two females) were videotaped and their reactions to specific 3- to 5-second segments of the clips were rated by a group of undergraduates. All five emotional categories were represented by each of the four encoders. Reaction sequences selected as decoding stimuli met the following criteria: 1) the encoder depicted in each clip reported experiencing the appropriate type of reaction (i.e., he or she reacted angrily to an anger-inducing clip, fearfully to a fear-inducing clip); and 2) raters labeled the encoder's reaction as a manifestation of the appropriate emotional response more often than any other category (i.e., "anger" was the label most commonly attached to the encoder's reaction to an anger-inducing clip, and so on).

Questionnaire

Subjects were assigned to one of two experimental groups based on their level of interpersonal functioning as indicated by parental responses to items on the Social Competence scale of the Achenbach Child Behavior Checklist (Achenbach & Edelbrock, 1982). This scale assesses a child's performance in areas such as peer and family relationships, school functioning, and involvement in recreational activities. Each child's raw score on the

scale was converted to an age-adjusted percentile score, and subjects were divided at the 50th percentile into groups demonstrating either above- or below-average levels of social competence. Demographic data on the children are listed in Appendix A.

Procedure

Subjects were tested in a laboratory room located in a university psychology building. The room contained a small desk and chair, a videocassette recorder (VCR), a color television monitor, and two false speakers--one on each side of the monitor. Inside one of the speakers was a camera that was used to record the subjects' reactions to the film clips. Most subjects knew that they were being videotaped but did not realize that the camera was actually in the room with them. On the desk in front of the child was a response form (see Appendices G and H), a folder containing questions relating to the film clips, and a remote control for the VCR so the child could turn the machine on and off between clips. The lighting was soft to increase the dramatic effect of the affect-inducing scenes, and subjects were tested individually to eliminate the risk of their responses being influenced by the reactions of others. An adjacent room equipped with a two-way mirror was used to observe subjects to be sure they were performing all tasks in the proper manner.

Encoding

The following instructions were read to all subjects:

In a few moments I'm going to show you a set of ten film clips, each about 2 to 3 minutes long, showing people in different situations. I want you to watch each clip very carefully and to pay especially close attention to how it is making you feel. Once the clip has ended and you've had a chance to think about it, you will be asked a question about how either the whole clip or a specific part of it made you feel. If you take a look at the top of the response form in front of you, you'll see that there are five emotions for you to choose from. They are: anger, disgust, a combination of fear and surprise, happiness and sadness. You probably already know what each of these words means, but I'd like to go through them with you just to be sure we have the same meanings in mind. (Experimenter reads through the response definitions with subject.)

Pilot data obtained from our undergraduate raters indicated that many people tended to circle "disgust" when they were extremely angered by a clip but didn't feel that the word "anger" was adequate in relaying the strength of their reaction. To prevent such occurrences, we followed the lead of Zabel (1979) in differentiating between the two categories. The instructions continue:

Sometimes people confuse anger and disgust. Anger is how you feel when you see someone do or say something that you really don't like, something that makes you really mad. Disgust is more physical--the way you feel when you see, smell or taste something that is rotten or diseased--anything that makes you feel kind of sick to your stomach. Okay? (Experimenter gives examples.)

You'll go through the same two steps for each clip you see. First, you'll watch the clip and think about how it is making you feel. Then, once the clip has ended, you'll pull out the question sheet just far enough so that you can read question #1 and once you've read it, you'll circle your answer to the

question on line 1 of your answer sheet. Then you'll do the same thing for the other 9 clips. Once you've answered the first question, you'll turn the VCR back on, watch the next clip, and then answer the next question after the clip has ended. Do you have any questions about what you're supposed to do? (If so, they are answered.)

Okay, two more things. If there is anything that you would rather not watch, feel free to close your eyes or look away until it's over. And if you have any problems or questions, just give a knock at the door and I will come in to help you. We'll start with the first one now.

The encoding task required an average of 35 minutes to complete. All subjects were presented with a set of ten affect-inducing scenes--two for each emotional category of interest--in a fixed randomized order. Their reactions were videotaped during the screening and then shown to a group of undergraduate raters who tried to identify the category of emotion encoded by the subject. If a rating matched the emotional response reported by the subject at the time of encoding, then the subject was said to have encoded an accurate response to that clip (based on the judgment of a given rater).

Decoding

The following instructions were given:

Now I'm going to show you some pictures of other people doing what you just did. They are watching a set of movie clips like the ones you just saw. This time your job will be to watch these people very carefully and to see if you can figure out how they are feeling just by looking at the expressions on their faces. Once you think you know how they are feeling, I want you to look back at the same list of

emotions and circle the one word that best describes how the person on the screen, this time, is feeling. Do you understand what you're supposed to do? (Any questions are answered.)

Now these are only about 4 or 5 seconds long so they go by pretty quickly. There is a 15-second pause between these clips so you probably won't need to stop the tape as you're going along. But if you want a little extra time to think about a clip, feel free to stop the tape at any time. Some of these expressions will be really easy to recognize, some will be really hard, and most will be somewhere in between. It's really important, though, that you circle an answer for each one and not leave any lines blank. If you have to guess, that's fine. Any questions? (If so, they are answered.) All right, we'll start with the first one now.

The decoding task required an average of 5 to 10 minutes to complete. Subjects were shown a silent tape containing a selection of 20 viewer reaction sequences and asked to indicate which of the five emotional categories was being displayed. The clips were presented to all the children in a fixed randomized order. A correct response was defined as subject agreement with the responses made by a group of undergraduate judges who had previously rated each of the same clips. Four viewer reaction sequences were presented for each of the five emotional categories. Once the encoding and decoding tasks had been completed, subjects and their parents were debriefed and any questions answered.

C H A P T E R I I I

Results

Encoding and Decoding Accuracy

Accuracy scores (in the form of percentages) were calculated for each subject, both overall and separately for encoding and decoding. Scores were also calculated for specific categories of emotion. For encoding, a subject's accuracy score represented the percentage of raters that were able to identify a subject's emotional states based on his or her facial expressions. Decoding accuracy scores were simply the percentage of viewer reaction sequences that each subject labeled correctly. To obtain homogeneity of variance and allow an analysis of variance, all percentage scores were later transformed using the arc sine transformation (see Myers, 1979).

The major analysis consisted of a 2 X 2 X 2 X 5 mixed design analysis of variance. There were two between subjects factors (social competence group and sex) and two within subjects factors (category of emotion and coding modality). Category of emotion refers to the five affective states of interest (anger, disgust, fear/surprise, happiness and sadness); coding modality includes whether the subject was encoding or decoding a given category of emotion. When the results showed

significant effects, post hoc comparisons were carried out using the Duncan New Multiple Range Test (Duncan, 1955).

Results of the analysis of variance are presented in Table 1. As expected, a significant main effect due to experimental group was revealed, with the high social competence children showing a greater overall level of accuracy than their less socially skilled peers, $F(1,29) = 8.76$, $p < .01$. The same pattern was observed for both encoding and decoding (see Table 2).

It should be noted, however, that the main effect for social competence level was modified by a significant interaction between group and sex, $F(1,29) = 7.31$, $p < .05$. Whereas males in both groups attained mean scores that were virtually identical (57.0 and 57.4 percent, respectively), females showed relatively large differences; those demonstrating above average levels of social competence attained a mean score of 62.9 percent while the mean for the below average group was only 47.2 percent (see Figure 1). Post hoc comparisons indicated that the mean accuracy score for the socially skilled females was significantly greater than those attained by the other three groups. Similarly, the mean score obtained by the less socially competent girls was significantly lower than all other groups. The main effect observed for social competence level, then, is due largely to differences between the two groups of females.

TABLE 1
 Analysis of Variance for Encoding and Decoding Accuracy

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Between Subjects			
Social Comp. Group (G)	1	.73758	8.76 **
Sex (S)	1	.01152	.14
G X S	1	.61526	7.31 *
Error	29	.08417	
Within Subjects			
Coding Modality (C)	1	4.22681	27.54 ***
C X G	1	.04199	.27
C X S	1	.00854	.06
C X G X S	1	.10348	.67
Error	29	.15348	
Category of Emotion (E)	4	4.31335	55.22 ***
E X G	4	.04861	.62
E X S	4	.02717	.35
E X G X S	4	.07687	.98
Error	116	.07812	
C X E	4	.30140	4.52 **
C X E X G	4	.14694	2.21
C X E X S	4	.03104	.47
C X E X G X S	4	.11161	1.68
Error	116	.06662	

* $\underline{p} < .05$

** $\underline{p} < .01$

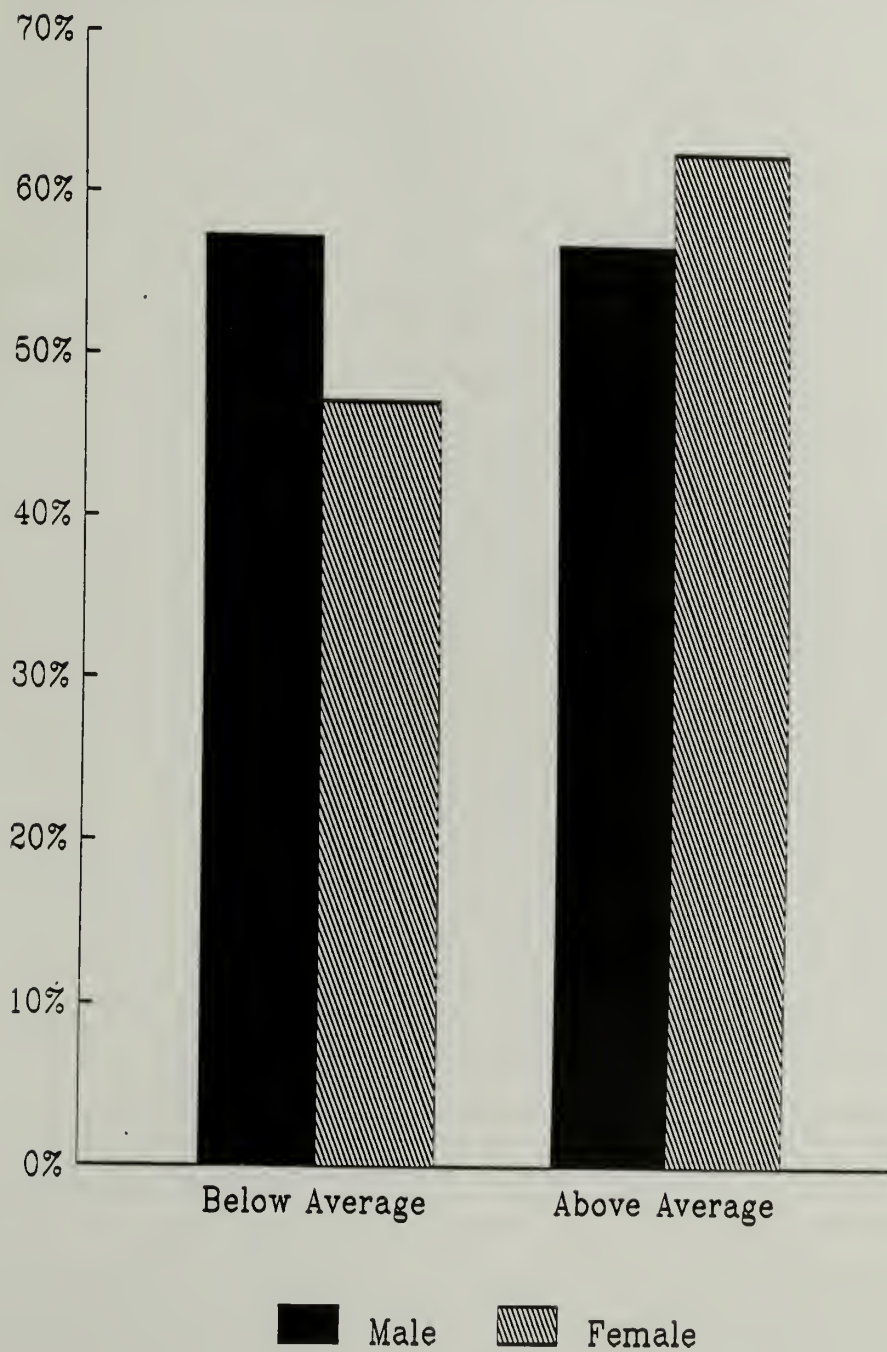
*** $\underline{p} < .0001$

TABLE 2

Mean Encoding and Decoding Accuracy--by Groups (%)

Level of Social Competence	Encoding	Decoding	Combined
Above Average	49.6	70.2	59.9
Below Average	45.5	63.6	54.5

FIGURE 1
Mean Accuracy Scores by Sex and Level of Social
Competence--Encoding and Decoding Combined



In addition to the significant main effect for social competence level and the group X sex interaction, a strong main effect was observed for category of emotion, $F(4,116) = 55.22$, $p < .0001$ (see Table 3). Post hoc comparisons showed that happiness was, by far, the affective state most accurately encoded and decoded, significantly outscoring the other four categories with an overall mean of 89.6 percent. Next came a cluster of three emotions--sadness (58.5 percent), disgust (58.2 percent), and fear/surprise (53.0 percent)--none of which differed significantly from each other in terms of their overall accuracy scores. Finally, anger proved to be the lowest-scoring emotion with a mean of 31.4 percent, significantly lower than each of the other four categories. Overall accuracy scores for all five emotional categories were at greater-than-chance levels.

Like the social competence main effect, the effect for type of emotion was also modified by a significant interaction--in this case, between coding modality and category of emotion, $F(4,116) = 4.52$, $p < .01$. For encoding, the pattern of means was similar to those identified for both coding modalities combined. Happiness was encoded with significantly greater accuracy than the other four categories (79.2 percent); next came the cluster of sadness (48.1 percent), fear (46.2 percent) and disgust (42.1 percent); and last was anger, which, at 25.7 percent,

TABLE 3

Mean Accuracy Scores--by Category of Emotion (%)

Category of Emotion	Encoding	Decoding	Combined
Anger	25.7a	37.1a	31.4a
Disgust	42.1b	74.2c	58.2b
Fear/Surprise	46.2b	59.8b	53.0b
Happiness	79.2c	100.0d	89.6c
Sadness	48.1b	68.9c	58.5b

(Similar subscripts indicate nonsignificant differences between means in the same column.)

was encoded with significantly less accuracy than any of the other four categories. With the exception of anger, all emotions were encoded at greater-than-chance levels of accuracy.

Decoding accuracy showed a slightly different pattern. All subjects successfully identified the four viewer reaction sequences representing the emotion of happiness. Not surprisingly, the mean for happiness was significantly greater than that of all other categories. Disgust (74.2 percent) and sadness (68.9 percent) followed next, with both showing mean accuracy scores significantly greater than the remaining two emotions--fear/surprise (59.8 percent) and anger (37.1 percent). Once again, anger proved to be the lowest-scoring category; it was decoded significantly less accurately than the other four emotions. All emotions were correctly decoded at greater-than-chance levels.

Finally, a main effect was found for coding modality, $F(1,29) = 27.54$, $p < .0001$. However, this finding is spurious because the scales and procedures for measuring the two types of coding were not comparable.

Errors In the Decoding of Children's Facial Expressions

The previous results indicate that overall, children in the above average social competence group were more

accurate than their below average counterparts in encoding and decoding the five emotional categories of interest in this investigation. They also point to a significant interaction between social skills level and gender, with females in the two experimental groups showing more disparity than males. Yet this information does not provide us with an understanding of what went on when a relatively nondecodable expression was exhibited by a given individual; specifically, it does not reveal the presence of any significant patterns in rater errors with respect to particular social competence or gender groups. In an attempt to identify any such patterns, error frequencies were calculated for each emotional category (both overall and by social competence level and sex) and a series of chi-square analyses were carried out.

In the first analysis, rater errors in decoding facial expressions of children in the two social competence groups were compared. Results showed that the relationship between social competence level and category of rater error was not statistically significant--error patterns were essentially the same for both groups (see Table 4). Similar results were obtained in an analysis comparing error patterns in decoding the expressions of males and females; although the emotional label "happiness" was misapplied three times more often to males than to females (12.2 versus 4.2 percent), the overall relationship (across

TABLE 4
 Frequency of Rater Errors in Decoding
 Children's Facial Expressions--by Group (%)

Level of Social Competence	Emotion Chosen by Raters				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
Above Average	19.4	12.4	26.7	8.9	32.5
Below Average	17.8	16.5	21.3	9.6	34.8

categories) between the two variables was not statistically significant (see Table 5).

An overall analysis (across categories) was also performed with the results displayed at the top of Table 6. In this case, the cell frequencies obtained represented a significant deviation from the expected value of 20 percent in each, $\chi^2(4, N = 1676) = 17.99, p < .01$. The labels "sadness" and "fear/surprise" were mistakenly applied at frequencies significantly greater than would be expected by chance. Similarly, the use of "disgust" and "happiness" in mislabeling facial expressions occurred at frequencies significantly less than chance. Errors involving the label "anger" did not deviate significantly from the expected value of 20 percent.

Finally, individual analyses (by category of emotion experienced) showed significant deviations from expected cell values for each of the five emotional categories (see Table 6). Expressions exhibited by individuals experiencing anger were most likely to be labeled as "sadness" or "fear/surprise" and least likely to be seen as "disgust" or "happiness," $\chi^2(3, N = 540) = 32.01, p < .001$. Feelings of disgust were most often mistaken for "fear/surprise" or "sadness" and least often for "happiness," $\chi^2(3, N = 356) = 13.85, p < .001$. Fear/surprise responses were frequently seen as "sadness" but were unlikely to be mislabeled as "happiness," χ^2

TABLE 5
 Frequency of Rater Errors In Decoding
 Children's Facial Expressions--by Sex (%)

Sex	Emotion Chosen by Raters				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
Male	17.1	13.4	26.5	12.2	30.8
Female	21.2	14.6	21.7	4.2	38.3

TABLE 6
 Frequency of Rater Errors in Decoding Children's
 Facial Expressions--by Category of Emotion (%)

Encoder's Response	Emotion Chosen by Raters				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
OVERALL	18.9	13.9	24.8	9.1	32.5
Anger	----	16.7	27.0	9.4	47.0
Disgust	21.1	----	35.7	11.8	31.5
Fear/Surp	22.1	19.9	----	13.1	44.8
Happiness	18.8	18.8	37.6	----	24.8
Sadness	46.6	16.2	33.1	4.1	----

(3, $N = 366$) = 22.72, $p < .001$. Errors in identifying children's expressions of happiness were less common, but once again "fear/surprise" and "sadness" were the categories most often selected when an expression was incorrectly decoded, $\chi^2 (3, N = 117) = 9.43, p < .01$. Finally, sadness was mistaken most often for "anger" and "fear/surprise," less frequently for "disgust," and only rarely for "happiness," $\chi^2 (3, N = 296) = 41.86, p < .001$.

Children's Decoding Errors

A second series of chi-square analyses was carried out in an attempt to identify any potential patterns in the decoding errors made by children. In the first, the two social competence groups were compared on the frequency with which specific emotional labels were incorrectly used in identifying expressions of the five affective states (see Table 7), with the results showing a significant relationship between these two variables, $\chi^2 (4, N = 187) = 10.21, p < .05$. Children in the below average group misapplied the label "happiness" three times as often as those in the above average group (19.2 as opposed to 6.4 percent); individuals in the latter group were much more likely to choose "anger" when they were unable to accurately judge a person's facial expressions (34.9 percent as opposed to 20.5 percent for the less

TABLE 7

Frequency of Children's Decoding Errors--by Group (%)

Level of Social Competence	Emotion Chosen by Children				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
Above Average	34.9	16.5	16.5	6.4	25.7
Below Average	20.5	12.8	19.2	19.2	28.2

socially competent children). Error frequencies for the remaining three emotional categories revealed no significant differences between groups.

An analysis comparing the error patterns of males and females indicated that the relationship between a child's sex and his or her likelihood of misapplying a specific emotional label was nonsignificant (see Table 8). However, the overall pattern of error frequencies (combining all levels of sex and social competence) revealed a significant deviation from the expected value of 20 percent in each of the five cells, $\chi^2 (4, N = 187) = 11.08, p < .05$ (see Table 9, top). "Anger" and "sadness" were chosen at greater-than-chance frequencies (28.9 and 26.7 percent, respectively), whereas the label "happiness" was misapplied less often than would be anticipated by chance, representing only 11.8 percent of the errors committed. The frequency of errors involving "disgust" and "fear/surprise" fell within the expected range.

Lastly, individual analyses (by type of emotion displayed) were carried out for four of the five affective categories, with three showing significant deviations from expected cell frequencies (see Table 9). Expressions of anger were most often mistaken for "disgust" and "sadness" and much less frequently for "happiness," $\chi^2 (3, N = 74) = 14.01, p < .01$. More than half the errors in mislabeling expressions of fear/surprise were identified as "anger,"

TABLE 8

Frequency of Children's Decoding Errors--by Sex (%)

Sex	Emotion Chosen by Children				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
Male	32.7	15.9	14.1	11.5	25.7
Female	23.0	13.5	23.0	12.2	28.4

TABLE 9
 Frequency of Children's
 Decoding Errors--by Category of Emotion (%)

Encoder's Response	Emotion Chosen by Children				
	Anger	Disgust	Fear/Surp	Happiness	Sadness
OVERALL	28.9	15.0	17.7	11.8	26.7
Anger	----	32.4	25.7	9.5	32.4
Disgust	32.3	----	16.1	29.0	22.6
Fear/Surp	56.3	2.1	----	2.1	39.6
Sadness	50.0	8.8	26.5	14.7	----

with "sadness" running a close second; misapplication of the labels "disgust" and "happiness" was quite rare, $\chi^2 (3, N = 48) = 89.67, p < .001$. Among the failed attempts at decoding expressions of sadness, "anger" was chosen at least twice as often as any of the remaining three categories, while "disgust" and "happiness" selections were relatively uncommon. Error patterns for the category of disgust did not deviate significantly from expected values. Finally, an error analysis was not performed for the last remaining category, happiness, since all children successfully identified the four viewer reaction sequences representing this emotion.

CHAPTER IV

Discussion

Consistent with the findings of previous studies looking at disturbed, socially withdrawn and peer-spurned children, results of the current investigation do indeed suggest differences in decoding accuracy based on an individual's interpersonal capabilities; children of above average social competence significantly outperformed their less socially skilled peers on this task. Differences were also observed for encoding accuracy, with the more socially skilled children again showing a significantly greater degree of accuracy in conveying affective information via facial expressions.

While a child's gender in and of itself does not seem to have much bearing on his or her accuracy in encoding or decoding emotions, there does appear to be a significant interaction between sex and social competence. Socially skilled females were more accurate in both coding modalities, but the opposite was true for those females demonstrating below average social skills. Among males, encoding and decoding accuracy did not appear to be closely tied to an individual's level of social competence.

A significant interaction between coding modality and either social competence level or sex was noticeably

absent. This suggests that encoding or decoding accuracy, with respect to specific emotional categories, did not differ as a function of either of these two variables. Such findings do not support the hypothesis that children with below average social skills might be less (or more) likely to convey accurate information about specific internal affective experiences than individuals who are more socially skilled. However, it is clear that certain emotions were encoded and decoded more accurately than others. Generally speaking, happiness was correctly identified and conveyed more often than the other four emotions, while anger was least likely to be successfully recognized or produced. Accuracy levels for specific affective categories differed depending on the coding modality. These differences and all other major findings will be discussed in greater detail in the sections that follow.

Effects Relating to Social Competence Level and Sex

The belief that nonverbal communication abilities play an important role in the development of general social competence is widely accepted and based on a large body of empirical evidence (e.g., see Blanck, Buck & Rosenthal, 1986; Feldman, 1982). Furthermore, the work of Paul Ekman (1982) and others has shown that facial expressions--both their production and recognition--comprise an integral

component of nonverbal communication. Therefore, the demonstration of significantly different levels of encoding and decoding accuracy by our two social competence groups provides even stronger evidence for the importance of facial expressions as a means of communicating information to others.

Results of the current study showed that children with above average levels of social competence were in fact more accurate not only in decoding facial expressions of emotion (as previous studies have indicated), but also in encoding such expressions in response to affect-inducing stimuli. This finding is particularly noteworthy because of the nature of the stimuli used to identify these differences. Rather than showing that children with varying social capabilities differ in their ability to produce posed facial expressions and to identify such artificial expressions in others, this investigation has shown that such children differ in the degree of encoding and decoding accuracy demonstrated in response to naturally-occurring stimuli.

As was previously noted, the combined effects of gender and social competence level revealed significant differences among groups; females showed marked disparities in their overall accuracy scores depending on their level of social effectiveness, while males did not. This finding suggests that success at encoding and decoding facial

expressions contributes much more to the general social competence of females than to males. One possible explanation for this is that male children in our culture have traditionally been encouraged to refrain from providing any external cues when experiencing strong affect; such behavior is often seen as a sign of weakness or vulnerability, especially as it relates to the expression of fear or sadness. Females, however, are expected to behave more "emotionally" and are therefore provided more freedom to display their feelings--both verbally and nonverbally.

An alternative explanation for this gender disparity is suggested by the fact that males are often taught to behave aggressively when attempting to communicate their thoughts and needs to those around them (Maccoby & Jacklin, 1974; Brooks-Gunn & Matthews, 1979). Females, on the other hand, are expected to use more passive means to express themselves and may therefore rely more heavily on nonverbal communication channels such as facial expressions or body posture when interacting with others.

While accuracy scores (both overall and separately for the two coding modalities) were clearly affected by the combination of social competence level and sex, this does not appear to be the case for errors made in encoding. Patterns in the misidentification of subjects' facial expressions were nearly identical for both the above- and

below-average social competence groups. However, significant differences were noted in the nature of subjects' decoding errors. When unable to identify a reaction sequence correctly, children in the below average group chose the label "happiness" three times as often as their highly socially skilled peers; individuals in the above average group were more likely to select "anger."

The observation noted above is quite interesting, suggesting that when uncertain about the emotional content of a given facial expression, the less socially competent children were more likely to take an optimistic stance and assume that the affective state being conveyed was a positive one. Individuals in the high social skills group, however, when confronted with a similar situation, generally chose a more negatively connoted label. While at first glance the former tendency might appear more socially adaptive, perhaps it is a less cautious approach to unknown situations such as this that separates the below average social skills children from their more successful peers. Individuals in the former group may in fact possess a certain degree of naïveté that allows them to view others' nonverbal cues in an unrealistically positive light, blinding them to the possible consequences of initiating an unwelcomed interaction.

Effects Related to Category of Emotion

As expected, significant differences were also observed in the accuracy with which specific affective states were identified and produced. For encoding, the category of happiness was expressed with the highest degree of accuracy; next came the cluster of sadness, disgust and fear/surprise; and finally, anger proved to be the emotion least accurately conveyed. With the exception of the relative non-encodability of anger, the current results are basically consistent with those obtained in previous investigations. The most obvious explanation for these findings relates to the social acceptability of openly expressing each of these emotions. Unless one is a funeral director, he or she has probably learned over time that expressions of positive emotions such as happiness are welcomed much more often than expressions of the remaining four emotions mentioned above. It therefore seems reasonable to assume that most individuals have had more practice displaying expressions of happiness and would consequently have developed a greater sophistication in the ability to convey such an emotional state nonverbally. Similarly, since anger is perhaps the least accepted form of emotional expression in everyday social situations, an individual would have had significantly fewer opportunities to develop his or her skill in displaying this emotion.

The accuracy patterns for decoding indicated that happiness and anger once again occupied the top and bottom positions (respectively) for Identifiability. An apparent ceiling effect was observed for the category of happiness, with all children successfully decoding expressions of this emotion. Unlike the results obtained for encoding, the remaining three categories did show some variation in their overall decodability, with disgust attaining the second highest accuracy rating, followed by sadness and fear/surprise. With the exception of the data on disgust (which has typically been found to be relatively difficult to decode), these results are fairly consistent with the findings of past investigations, most of which have identified happiness and sadness as the easiest emotions for children to decode and anger or fear (typically not combined with surprise) as the most difficult (Odom & Lemond, 1972; Field & Walden, 1982; Kirouac & Doré, 1983).

Differences in encoding and decoding accuracy for the emotions of disgust and fear/surprise are well accounted for by the social acceptability hypothesis. Whereas facial expressions of these emotions are fairly distinct (e.g., nose wrinkling and upper lip raising for disgust, eye widening and mouth opening for fear/surprise), the open display of these two emotions is generally not encouraged in our culture, except under certain prescribed circumstances. Therefore, the relative ease with which

disgust and fear/surprise were decoded (as opposed to encoded) may be due to the effects of increased discriminability and decreased experience in displaying these emotions.

The social acceptability hypothesis can also be extended to explain the extreme scores obtained for decoding accuracy with respect to happiness and anger: If these emotions are significantly more or less likely to be expressed in social situations, then we would expect differing levels of decoding expertise due to the amount of experience an individual has had in trying to identify such expressions in others. On the other hand, such an explanation may be a bit too simplistic in that experiences involving intense emotional encounters (e.g., those involving the expression of anger) often seem to have a sensitizing effect whereas exposure to milder or more common forms of expression (such as happiness) probably would not have such a profound influence.

Concluding Remarks

The findings of this study, coupled with those obtained in prior investigations, clearly demonstrate that a high degree of skill and understanding in the area of human facial expressiveness is closely associated with general social competence in children. For females in particular, knowledge of (and the skill to successfully

convey) such nonverbal cues may play an important role in the ability to interact effectively with one's social environment. And while a limited capability in this area does not appear to have a detrimental effect on males' ability to function interpersonally, providing children of both sexes with a greater understanding of nonverbal communication channels in general (and facial expressions in particular) can only serve to heighten their sensitivity to the thoughts and feelings of those around them.

Because the population of children sampled in this study was basically a nonclinical one, the relatively poorer degree of accuracy demonstrated by the below average social competence group may not be generalizable to severely asocial individuals. In future studies comparing the nonverbal skills of children with varying levels of social competence, it might prove useful to also look at socially dysfunctional individuals so that potential differences between children representing both extremes of the social-asocial continuum could be more clearly identified with a higher degree of certainty and would not need to be inferred.

It would also be important to take subjects' intelligence level into account as a variable that could theoretically effect the results obtained in such an investigation. Because the intellectual capabilities of our subjects were not assessed, we were not able to control

for this factor and cannot rule it out as a potential source of variance. If there is a significant relationship between intelligence and a child's encoding and decoding accuracy, the former could be partially responsible for the differences observed between the two social competence groups. Administering an abbreviated version of any standardized intelligence test to all subjects would be one way of securing the necessary information and avoiding this problem.

The results of the current study suggest numerous potentially fruitful avenues of investigation that could provide us with a better understanding of the development of nonverbal communication abilities in children. An examination of parents' (as well as their children's) accuracy in encoding and decoding various facial expressions of emotion seems a reasonable next step. Such an investigation might reveal the presence of intrafamilial patterns in the expression and recognition of nonverbal cues. For example, do children tend to resemble their same-sex parent in the way they express themselves nonverbally? Does one parent seem to have a greater influence on the development of a child's nonverbal repertoire? If so, what about children in single parent families?

The intensity with which a child and his or her family members express themselves is another area worth pursuing.

Are certain members more likely to express positive as opposed to negative feelings of emotion (or vice versa)? Is there a correlation between verbal and nonverbal expressiveness? Does there appear to be an optimal level of expressiveness for males or females, adults or children?

Finally, there is the question of training. Can children who are demonstrably lacking in interpersonal effectiveness be taught to identify and produce certain primary facial expressions of emotion? If so, could these new skills actually enable them to improve their sociometric status? Of what would such a training program consist and in what setting should it occur? In the child's home? At school? In the context of a therapeutic environment? Clearly, there are many important questions still to be answered.

APPENDIX A
DEMOGRAPHIC DATA ON SUBJECTS

	Level of Social Comptence		
	Below Avg.	Above Avg.	Overall
Sex			
male	8	11	19
female	3	11	14
Total	11	22	33
Age			
mean (In years)	11.1	11.2	11.2
minimum	10.4	9.7	9.7
maximum	12.4	12.5	12.5
Social Competence Percentile Scores			
mean	27	77	61
minimum	10	57	10
maximum	46	99	99
Ethnic Background			
American Indian	0	1	1
Asian	0	1	1
Black	1	0	1
Caucasian	7	19	26
Hispanic	1	1	2
Other	2	0	2
Total	11	22	33
Annual Family Income			
less than \$10,000	3	4	7
\$10,000 to \$25,000	4	6	10
\$25,000 to \$50,000	2	9	11
\$50,000 or more	2	3	5
Total	11	22	33

APPENDIX B

RATER RESPONSE FORM--INITIAL SELECTION OF ENCODING STIMULI

Sex _____ Age _____ Group _____

A) Please circle the one label that best describes your reaction to the clip which you just viewed:

anger disgust fear happiness sadness other _____

B) Circle the number that corresponds to the strength of the reaction you experienced:

very weak 1 2 3 4 5 6 7 very strong

C) What aspects of the clip do you feel were most responsible for the reaction you experienced? In other words, what was it about the clip that made you feel happy, sad, etc.? If you need extra space, you may use the back of this sheet.

APPENDIX C

TEXT OF LETTER SENT TO PARENTS OF POTENTIAL SUBJECTS

Dear Parent:

We are writing to solicit your participation in a research study at the University of Massachusetts. In this project, we will be looking at the ability of children and their parents to identify and produce different facial expressions of emotion.

This study has been approved by (Principal) and the (School) Research Review Board, who have given us permission to recruit a sample of children from the school. In return for the time and effort involved in the school's participation in the study, we have arranged to make a donation of \$50.00 to the (School) Improvement Council.

We are well aware of the hectic daily schedule faced by most families and have worked out a data collection procedure which should require only a minimal amount of time. Your contribution would be divided into two phases: In the first, we will ask you and your child to come to the University to view a series of film clips and fill out some questionnaires. This will require approximately 90 minutes. The second phase can be completed either here at the University or in your home if it is more convenient. You and your child will be shown a videotape containing the other's responses during the first phase of the study and you will be asked to record your reactions to the tape on an accompanying questionnaire. The second phase will require only about 30 minutes to complete.

We expect that this will be an interesting and enjoyable experience for both you and your child. Participating families will receive a stipend of \$20.00 to cover the cost of transportation and babysitting, or we can arrange to have a check made out directly to your child if you prefer.

Enclosed is a response form which we would appreciate your completing to let us know whether or not you are interested in participating. A pre-addressed, postage-paid envelope is enclosed for your convenience.

If you have expressed an interest in participating, we will contact you by phone to schedule a viewing appointment at your earliest convenience. Please be assured that all of the responses and information you provide will be held

APPENDIX C (CONTINUED)

In the strictest confidence. If you should have any questions, feel free to contact us anytime at (phone #).

Thank you for your consideration of this study. We look forward to hearing from you soon.

Sincerely,

Robert J. Custrini
Project Director

Robert S. Feldman, Ph.D.
Professor of Psychology

APPENDIX D
SUBJECT INTEREST FORM

Participant Information Form

Child's Name _____

Grade In School _____ Classroom Instructor _____

Parent Name(s) _____

Address _____

Phone _____

Best Time to Reach You _____

_____ Yes, I am interested in participating in the study described in your letter. Please contact me to schedule a viewing appointment.

_____ No, I am not interested in participating.

Name

Signature

Date

APPENDIX E

INFORMED CONSENT FORM

As participants in this study, I understand that my child and I will be shown a series of videotaped film clips and asked to record our reactions to each on an accompanying questionnaire. I further understand that other means of data collection such as audiotaping, videotaping, interviewing or additional questionnaires, may be employed during the first phase of the experiment and that some of our responses may be scored by a group of novice raters. All responses will be confidential.

I also grant permission for my child's classroom teacher at (School) to fill out a checklist (which has been shown to me) on my child's behavior in the classroom.

In return for our participation, we will receive a stipend of \$20.00 from the University during the second phase of this study in approximately 1-2 weeks.

I have read the above statement and agree to participate in the study described. Any questions I had have been answered to my satisfaction. I understand that my participation is voluntary and that if necessary, I may withdraw consent and discontinue participation at any time.

Signature of Mother

Signature of Father

Name (please print)

Name (please print)

Date

Date

APPENDIX F

FAMILY INFORMATION FORM

Please try to answer each of the following questions as completely as possible.

Child Information

Name of child participating in study: _____

Birthdate: _____ Grade in School: _____

Place of Birth: _____

Ethnic Background (please check one)

American Indian

Asian

Black

Caucasian

Hispanic

Other (please specify): _____

Has your son/daughter lived with you continuously since birth?

yes

no If no, who else has s/he lived with and for how long? _____

Parent Information

Father's Name: _____ Mother's Name: _____

Date of Birth: _____ Date of Birth: _____

Place of Birth: _____ Place of Birth: _____

Profession: _____ Profession: _____

Biological Father? __yes __no Biological Mother? __yes __no

Estimated Yearly Family Income:

less than \$10,000

\$10,000 to \$25,000

\$25,000 to \$50,000

\$50,000 to \$75,000

\$75,000 or more

APPENDIX G

SUBJECT RESPONSE FORM--ENCODING

- Anger -- being mad, irritated, annoyed, bothered, displeased or ticked off.
- Disgust -- seeing something that is sickening, nauseating, revolting, rotten or really gross.
- Fear/ Surprise -- being frightened, startled, afraid, terrified or surprised by something.
- Happiness -- being pleased, amused, delighted, joyful or seeing something that is humorous or funny.
- Sadness -- a feeling of sorrow, unhappiness, grief or a sense of loss.

Circle the best label:

- | | | | | | |
|-----|-------|---------|---------------|-----------|---------|
| 1. | anger | disgust | fear/surprise | happiness | sadness |
| 2. | anger | disgust | fear/surprise | happiness | sadness |
| 3. | anger | disgust | fear/surprise | happiness | sadness |
| 4. | anger | disgust | fear/surprise | happiness | sadness |
| 5. | anger | disgust | fear/surprise | happiness | sadness |
| 6. | anger | disgust | fear/surprise | happiness | sadness |
| 7. | anger | disgust | fear/surprise | happiness | sadness |
| 8. | anger | disgust | fear/surprise | happiness | sadness |
| 9. | anger | disgust | fear/surprise | happiness | sadness |
| 10. | anger | disgust | fear/surprise | happiness | sadness |

APPENDIX H

SUBJECT/RATER RESPONSE FORM--DECODING

- Anger -- being mad, irritated, annoyed, bothered, displeased or ticked off.
- Disgust -- seeing something that is sickening, nauseating, revolting, rotten or really gross.
- Fear/ Surprise -- being frightened, startled, afraid, terrified, or surprised by something.
- Happiness -- being pleased, amused, delighted, joyful or seeing something that is humorous or funny.
- Sadness -- a feeling of sorrow, unhappiness, grief or a sense of loss.

What was the person in this clip feeling?

- | | | | | | |
|-----|-------|---------|---------------|-----------|---------|
| 1. | anger | disgust | fear/surprise | happiness | sadness |
| 2. | anger | disgust | fear/surprise | happiness | sadness |
| 3. | anger | disgust | fear/surprise | happiness | sadness |
| 4. | anger | disgust | fear/surprise | happiness | sadness |
| 5. | anger | disgust | fear/surprise | happiness | sadness |
| 6. | anger | disgust | fear/surprise | happiness | sadness |
| 7. | anger | disgust | fear/surprise | happiness | sadness |
| 8. | anger | disgust | fear/surprise | happiness | sadness |
| 9. | anger | disgust | fear/surprise | happiness | sadness |
| 10. | anger | disgust | fear/surprise | happiness | sadness |

APPENDIX H (CONTINUED)

11.	anger	disgust	fear/surprise	happiness	sadness
12.	anger	disgust	fear/surprise	happiness	sadness
13.	anger	disgust	fear/surprise	happiness	sadness
14.	anger	disgust	fear/surprise	happiness	sadness
15.	anger	disgust	fear/surprise	happiness	sadness
16.	anger	disgust	fear/surprise	happiness	sadness
17.	anger	disgust	fear/surprise	happiness	sadness
18.	anger	disgust	fear/surprise	happiness	sadness
19.	anger	disgust	fear/surprise	happiness	sadness
20.	anger	disgust	fear/surprise	happiness	sadness

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