

## CONSTANTS ACROSS CULTURES IN THE FACE AND EMOTION<sup>1</sup>

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This study addresses the question of whether any facial expressions of emotion are universal. Recent studies showing that members of literate cultures associated the same emotion concepts with the same facial behaviors could not demonstrate that at least some facial expressions of emotion are universal; the cultures compared had all been exposed to some of the same mass media presentations of facial expression, and these may have taught the people in each culture to recognize the unique facial expressions of other cultures. To show that members of a preliterate culture who had minimal exposure to literate cultures would associate the same emotion concepts with the same facial behaviors as do members of Western and Eastern literate cultures, data were gathered in New Guinea by telling subjects a story, showing them a set of three faces, and asking them to select the face which showed the emotion appropriate to the story. The results provide evidence in support of the hypothesis that the association between particular facial muscular patterns and discrete emotions is universal.

Prolonged and at times heated controversy has failed to demonstrate whether facial behaviors associated with emotion are universal for man or specific to each culture. Darwin (1872) postulated universals in facial behavior on the basis of his evolutionary theory. Allport (1924), Asch (1952), and Tomkins (1962, 1963) have also postulated universals in emotional facial behavior, although each writer offered a different theoretical basis for his expectation. The culture-specific view, that facial behaviors become associated with emotion through culturally variable learning, received support from Klineberg's (1938) descriptions of how the facial behaviors described in Chinese literature differed from the facial behaviors associated

with emotions in the Western world. More recently, Birdwhistell (1963) and LaBarre (1947) have argued against the possibility of any universals in emotional facial behavior, supplying numerous anecdotal examples of variations between cultures.

Ekman (1968) and Ekman and Friesen (1969) considered these contradictory viewpoints within a framework which distinguished between those elements of facial behavior that are universal and those that are culture specific. They hypothesized that the universals are to be found in the relationship between distinctive patterns of the facial muscles and particular emotions (happiness, sadness, anger, fear, surprise, disgust, interest). They suggested that cultural differences would be seen in some of the stimuli, which through learning become established as elicitors of particular emotions, in the rules for controlling facial behavior in particular social settings, and in many of the consequences of emotional arousal.

To demonstrate the hypothesized universal element, Ekman and Friesen (1969) conducted experiments in which they showed still photographs of faces to people from different cultures in order to determine whether the same facial behavior would be judged as the same emotion, regardless of the observers' culture. The faces were selected on the basis of their conformity to Ekman, Friesen, and Tomkins's (in press) a priori descriptions of facial muscles

<sup>1</sup> The authors are indebted to E. Richard Sorenson, National Institute of Neurological Diseases and Blindness, for collaboration in planning the early stages of this research, and providing background material relevant to understanding of the Fore people. The authors are also grateful to Neville Hoffman, University of Western Australia, for his extraordinary ability to enlist cooperation from subjects and his many useful suggestions about the procedure. The research was supported by Grant AFOSR 1229-67 from the Advanced Research Projects Agency and Career Scientist Development Award 5-KO2-MH060 92 from the National Institute of Mental Health. Patricia Garlan and Robert Kleck provided editorial help on the preparation of this report.

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involved in each emotion. College-educated subjects in Brazil, the United States, Argentina, Chile, and Japan were found to identify the same faces with the same emotion words, as were members of two preliterate cultures who had extensive contact with Western cultures (the Sadong of Borneo and the Fore of New Guinea), although the latter results were not as strong (Ekman, Sorenson, & Friesen, 1969). Izard (1968, 1969), working independently with his own set of faces, obtained comparable results across seven other culture-language groups.

While these investigators interpreted their results as evidence of universals in facial behavior, their interpretation was open to argument; because all the cultures they compared had exposure to some of the same mass media portrayals of facial behavior, members of these cultures might have learned to recognize the same set of conventions, or become familiar with each other's different facial behavior.

To overcome this difficulty in the interpretation of previous results, it is necessary to demonstrate that cultures which have had minimal visual contact with literate cultures show similarity to these cultures in their interpretation of facial behavior. The purpose of this paper was to test the hypothesis that members of a preliterate culture who had been selected to insure maximum visual isolation from literate cultures will identify the same emotion concepts with the same faces as do members of literate Western and Eastern cultures.

#### METHOD

##### *Subjects*

Members of the Fore linguistic-cultural group of the South East Highlands of New Guinea were studied. Until 12 years ago, this was an isolated, Neolithic, material culture (Gajdusek, 1963; Sorenson & Gajdusek, 1966). While many of these people now have had extensive contact with missionaries, government workers, traders, and United States scientists, some have had little such contact. Only subjects who met criteria established to screen out all but those who had minimal opportunity to learn to imitate or recognize uniquely Western facial behaviors were recruited for this experiment. These criteria made it quite unlikely that subjects could have so completely learned some foreign set of facial expressions of emotion that their judgments would be no different from those of members of literate cultures. Those selected had seen no movies, neither

spoke nor understood English or Pidgin, had not lived in any of the Western settlement or government towns, and had never worked for a Caucasian (according to their own report). One-hundred and eighty-nine adults and 130 children, male and female, met these criteria. This sample comprises about 3% of the members of this culture.

In addition to data gathered from these more visually isolated members of the South Fore, data were also collected on members of this culture who had had the most contact with Westerners. These subjects all spoke English, had seen movies, lived in a Western settlement or government town, and had attended a missionary or government school for more than 1 year. Twenty-three male adults, but no females, met these criteria.

##### *Judgment Task*

In a pilot study conducted 1 year earlier with members of this same culture, a number of different judgment tasks were tried. The least Westernized subjects could not be asked to select from a printed list of emotion terms the one that was appropriate for a photograph, since they could not read. When the list was repeated to them with each photograph, they seemed to have difficulty remembering the list. Further, doubts remained about whether the meaning of a particular emotion concept was adequately conveyed by translating a single English word into a single South Fore word. Asking the subject to make up his own story about the emotions shown in a picture was not much more successful, although the problems were different. Subjects regarded this as a very difficult task, repeated probes were necessary, and as the procedure became lengthy, subjects became reluctant.

To solve these problems, it was decided to employ a task similar to that developed by Dashiell (1927) for use with young children.<sup>3</sup> Dashiell showed the child a group of three pictures simultaneously, read a story, and told the child to point to the picture in which the person's face showed the emotion described in the story. The advantages of this judgment task in a preliterate culture are that (a) the translator recounts well-rehearsed stories which can be recorded and checked for accurate translation; (b) the task involves no reading; (c) the subject does not have to remember a list of emotion terms; (d) the subject need not speak, but can point to give his answer; and (e) perfect translation of emotion words is not required since the story can help provide connotations.

##### *Emotion Stories*

With the exception of the stories for fear and surprise, those used in the present study were selected from those which had been most frequently given in the pilot study. Considerable care was taken to insure that each story selected was relevant to only one emotion within the Fore culture, and that members of the culture were agreed on what that emotion was. Since the stories told

<sup>3</sup> Carrol E. Izard brought Dashiell's procedure to our attention. This method has also been used in recent studies of referential communications (e.g., Rosenberg & Gordon, 1968).

by the pilot subjects for fear and surprise did not meet these criteria, the authors composed stories for these emotions based on their experience within the culture. The stories used are given below:

**Happiness:** His (her) friends have come, and he (she) is happy.

**Sadness:** His (her) child (mother) has died, and he (she) feels very sad.

**Anger:** He (she) is angry; or he (she) is angry, about to fight.

**Surprise:** He (she) is just now looking at something new and unexpected.

**Disgust:** He (she) is looking at something he (she) dislikes; or He (she) is looking at something which smells bad.

**Fear:** He (she) is sitting in his (her) house all alone, and there is no one else in the village. There is no knife, axe, or bow and arrow in the house. A wild pig is standing in the door of the house, and the man (woman) is looking at the pig and is very afraid of it. The pig has been standing in the doorway for a few minutes, and the person is looking at it very afraid, and the pig won't move away from the door, and he (she) is afraid the pig will bite him (her).<sup>4</sup>

#### *Pictures and Emotions*

The six emotions studied were those which had been found by more than one investigator to be discriminable within any one literate culture (cf. Ekman, Friesen, & Ellsworth, in press, for a review of findings). The photographs used to show the facial behavior for each of the six emotions had been judged by more than 70% of the observers in studies of more than one literate culture as showing that emotion. The sample included pictures of both posed and spontaneous behavior used by Ekman and Friesen (1968), Frijda (1968), Frois-Wittmann (1930), Izard (1968), Engen, Levy, and Schlosberg (1957), and Tomkins and McCarter (1964). A total of 40 pictures were used of 24 different stimulus persons, male and female, adult and child. The photographs were prepared as 3 × 5 inch prints, cropped to show only the face and neck.

#### *Story-Photographs Trial*

A single item consisted of an emotion story, a correct photograph, in which the facial behavior shown in the photograph was the same as that described in the story, and either one or two incorrect photograph(s). Adult subjects were given two incorrect pictures with each correct picture; children were given only one because of a shortage of copies of the stimuli.

Because of a limitation on the number of available photographs, and upon the subjects' time, not all of the possible pairings of correct and incorrect photographs were tested. Instead, the subjects were presented with some of the presumably more difficult discriminations among emotions. The emotion shown in at least one of the incorrect photographs was an emotion which past studies in literate cultures had found to be most often mistaken for the correct emotion. For example, when *anger* was the emotion described in the

<sup>4</sup>The fear story had to be long in order to eliminate possibilities for anger or surprise being associated with the story.

story, the incorrect choices included *disgust*, *fear*, or *sadness*, emotions which have been found to be often mistaken for anger. The age and sex of the stimulus persons shown in the correct and incorrect photographs were held constant within any trial.

No one subject was given all the emotion discriminations, because again the stimuli would have been too few and the task too long. Instead, subjects from different villages were required to make some of the same and some different discriminations. Subjects were shown from 6 to 12 sets of photographs, but no picture appeared in more than 1 of the sets shown to any one particular subject.<sup>5</sup> A subject's task included making at least three different emotion discriminations; the same story was told more than once, with differing correct and incorrect photographs, and often requiring discrimination among differing sets of emotions. For example, the anger story might have been read once with Anger Picture A, Sadness Picture B, and Fear Picture C; the same anger story might have been read again to the same subject, but now with Anger Picture D, Disgust Picture E, and Surprise Picture F.

#### *Procedure*

Two-person teams conducted the experiment. A member of the South Fore tribe recruited subjects, explained the task, and read the translated stories; a Caucasian recorded the subjects' responses. Three such teams operated at once within a village; one team with a male Caucasian worked with male adult subjects; the two others with female Caucasians worked with the female adult subjects and the children. In most instances, almost all members of a village participated in the experiment within less than 3 hours.

Considerable practice and explanation was given to the translators. They were told that there was no correct response and were discouraged from prompting. Repeated practice was given to insure that the translators always repeated the stories in the same way and resisted the temptation to embellish. Spot checks with tape recordings and back translations verified that this was successful. The Caucasians, who did know the correct responses, averted their faces from the view of the subject, looking down at their recording booklet, to reduce the probability of an unwitting experimenter bias effect. Data analysis did not reveal any systematic differences in the responses obtained with different translators.

#### RESULTS

No differences between male and female subjects were expected, and no such differences had been found in the literate culture data. In this New Guinea group, however, the women

<sup>5</sup>The number of sets of photographs shown varied among villages, because a limited number of photographs were available in this field setting; the need to assure that the three pictures in any one set were comparable (in terms of the configuration of the mouth, the tilt of the head, and the age of the stimulus persons) restricted the number of sets which could be composed for some of the combinations.

were more reluctant to participate in the experiment, and were considered by most outsiders to have had less contact with Caucasians than the men. The number of correct responses for each subject was calculated separately for males and females and for adults and children. The *t* tests were not significant; the trend was in the direction of better performance by women and girls. The data revealed no systematic differences between male and female subjects in the discrimination of particular emotions, or in relation to the sex of the stimulus person shown on the photographs. In the subsequent analyses, data from males and females were combined.

Table 1 shows the results for the least Westernized adults for each emotion discrimination. Within each row, the percentage of subjects who gave the correct response for a particular discrimination between three emotions was calculated across all subjects shown that particular discrimination, regardless of whether the photographs used to represent the three emotions differed for individual subjects. Within each row, each subject contributed only one response, and thus the sum of responses was derived from independent subjects. However, the rows are not independent of each other. Data from a given subject appear in different rows, depending upon the particular dis-

TABLE 1  
ADULT RESULTS

Emotion described in the story	Emotions shown in the two incorrect photographs	No. Ss	% choosing correct face
Happiness	Surprise, disgust	62	90**
	Surprise, sadness	57	93**
	Fear, anger	65	86**
Anger	Disgust, anger	36	100**
	Sadness, surprise	66	82**
	Disgust, surprise	31	87**
Sadness	Fear, sadness	31	87**
	Anger, fear	64	81**
	Anger, surprise	26	81**
Disgust (smell story)	Anger, happiness	31	87**
	Anger, disgust	35	69*
	Disgust, surprise	35	77**
Disgust (dislike story)	Sadness, surprise	65	77**
	Sadness, surprise	36	80**
Surprise	Fear, disgust	31	71*
	Happiness, anger	31	65*
Fear	Anger, disgust	92	64**
	Sadness, disgust	31	87**
	Anger, happiness	35	86**
	Disgust, happiness	26	85**
	Surprise, happiness	65	48
	Surprise, disgust	31	52
	Surprise, sadness	57	28*

\*  $p < .05$ .

\*\*  $p < .01$ .

<sup>a</sup> Subjects selected the surprise face (67%) at a significant level ( $p < .01$ , two-tailed test).

TABLE 2  
RESULTS FOR CHILDREN

Emotion described in the story	Emotion shown in the one incorrect photograph	No. Ss	% choosing the correct face
Happiness	Surprise	116	87 <sup>a</sup>
	Sadness	25	96 <sup>a</sup>
	Anger	25	100 <sup>a</sup>
Anger	Disgust	25	88 <sup>a</sup>
	Sadness	69	90 <sup>a</sup>
	Anger	60	85 <sup>a</sup>
Sadness	Surprise	33	76 <sup>a</sup>
	Disgust	27	89 <sup>a</sup>
	Fear	25	76 <sup>a</sup>
Disgust (smell story)	Sadness	19	95 <sup>a</sup>
	Sadness	27	78 <sup>a</sup>
	Happiness	14	100 <sup>a</sup>
Disgust (dislike story)	Disgust	14	100 <sup>a</sup>
	Fear	19	95 <sup>a</sup>
Fear	Sadness	25	92 <sup>a</sup>
	Anger	25	88 <sup>a</sup>
	Disgust	14	100 <sup>a</sup>

\*  $p \leq .01$ .

criminations he was asked to make. If a group of subjects was requested to discriminate the same emotion from the same two other emotions more than once, only one randomly chosen response was included in the table.

A binomial test of significance assuming chance performance to be one in three showed that the correct face was chosen at a significant level for all of the discriminations (rows) except that of fear from surprise. Twice, fear was not discriminated from surprise, and once surprise was chosen more often than fear, even though the story had been intended to describe fear. A binomial test assuming chance to be one in two (a more conservative test, justified if it was thought that within a set of three pictures, there may have been one which was obviously wrong) still yielded significant correct choices for all but the fear-from-surprise discriminations.

The results for the most Westernized male adults were almost exactly the same as those reported in Table 1 for the least Westernized male and female adults. The number of correct responses for each subject was calculated; the *t* test showed no significant difference between the most and least Westernized subjects. Again, the only failure to select the correct picture occurred when fear was to be distinguished from surprise.

Table 2 shows the results for the children, tabulated and tested in similar fashion. The children selected the correct face for all of their discriminations. Through an oversight, the one discrimination which the adults could not

make, fear from surprise, was not tried with the children. The percentages reported in Table 2 are generally higher than those in Table 1, but this is probably due to the fact that the children were given two photographs rather than three, and chance performance would be 50% rather than about 33%. Six- and 7-year-old children were compared with 14- and 15-year-olds, by the same procedures as described for comparing males and females. No significant differences or trends were noted.

#### DISCUSSION

The results for both adults and children clearly support our hypothesis that particular facial behaviors are universally associated with particular emotions. With but one exception, the faces judged in literate cultures as showing particular emotions were comparably judged by people from a preliterate culture who had minimal opportunity to have learned to recognize uniquely Western facial expressions. Further evidence was obtained in another experiment, in which the facial behavior of these New Guineans was accurately recognized by members of a literate culture. In that study, visually isolated members of the South Fore posed emotions, and college students in the United States accurately judged the emotion intended from their videotaped facial behavior. The evidence from both studies contradicts the view that all facial behavior associated with emotion is culture specific, and that posed facial behavior is a unique set of culture-bound conventions not understandable to members of another culture.<sup>6</sup>

The only way to dismiss the evidence from both the judgment and posing studies would be to claim that even these New Guineans who had not seen movies, who did not speak or understand English or Pidgin, who had never worked for a Caucasian, still had *some* contact with Westerners, sufficient contact for them to

<sup>6</sup> If posed behavior were simply a set of arbitrary conventions, it would be unlikely that the same conventions would be utilized in the cultures discussed here. That does not, however, imply that posed facial behavior is identical with spontaneous behavior. Ekman, Friesen, and Ellsworth (in press) have suggested that most posed behavior is similar in appearance to that spontaneous facial behavior which is of extreme intensity and unmodulated, although it may still differ in onset, duration, and decay time.

learn to recognize and simulate culture-specific, uniquely Western facial behaviors associated with each emotion. While these subjects had some contact with Westerners, this argument seems implausible for three reasons. First, the criteria for selecting these subjects makes it highly improbable that they had learned a "foreign" set of facial behaviors to such a degree that they could not only recognize them, but also display them as well as those to whom the behaviors were native. Second, contact with Caucasians did not seem to have much influence on the judgment of emotion, since the most Westernized subjects did no better than the least Westernized and, like the latter, failed to distinguish fear from surprise. Third, the women, who commonly have even less contact with Westerners than the men, did as well in recognizing emotions.

The hypothesis that there are constants across cultures in emotional facial behavior is further supported by Eibl-Eibesfeldt's (1970) films of facial behavior occurring within its natural context in a number of preliterate cultures. Evidence of constants in facial behavior and emotion across cultures is also consistent with early studies which showed many similarities between the facial behavior of blind and sighted children (Fulcher, 1942; Goodenough, 1932; Thompson, 1941). Universals in facial behavior associated with emotion can be explained from a number of nonexclusive viewpoints as being due to evolution, innate neural programs, or learning experiences common to human development regardless of culture (e.g., those of Allport, 1924; Asch, 1952; Darwin, 1872; Huber, 1931; Izard, 1969; Peiper, 1963; Tomkins, 1962, 1963). To evaluate the different viewpoints will require further research, particularly on early development.

The failure of the New Guinean adults to discriminate fear from surprise, while succeeding in discriminating surprise from fear, and fear from other emotions, suggests that cultures may not make *all* of the same distinctions among emotions, but does not detract from the main finding that most of the distinctions were made across cultures. Experience within a culture, the kinds of events which typically elicit particular emotions, may act to influence the ability to discriminate particular pairs of

emotions. Fear faces may not have been distinguished from surprise faces, because in this culture fearful events are almost always also surprising; that is, the sudden appearance of a hostile member of another village, the unexpected meeting of a ghost or sorcerer, etc.

The growing body of evidence of a pan-cultural element in emotional facial behavior does not imply the absence of cultural differences in the face and emotion. Ekman (1968) and Ekman and Friesen (1969) have suggested that cultural differences will be manifest in the circumstances which elicit an emotion, in the action consequences of an emotion, and in the display rules which govern the management of facial behavior in particular social settings. Izard (1969) agrees with the view that there are cultural differences in the antecedent and consequent events, and has also found evidence suggesting differences in attitudes about particular emotions.

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(Received January 29, 1970)