

## I CAN SEE IT ALL OVER YOUR FACE!

Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology*, 11, 124-129.

Think of something funny. What is the expression on your face? Now think of something in your past that made you sad. Did your face change? Chances are it did. Undoubtedly, you are aware that certain facial expressions coincide with specific emotions. And, most of the time, you can probably tell how people are feeling emotionally from the expressions on their faces. Now, consider this: Could you be equally successful in determining someone's emotional state based on facial expression if that person is from a different culture—say, Romania, Sumatra, or Mongolia? In other words, do you believe facial expressions of emotion are universal? Most people believe that they are, until they stop and consider how radically different other cultures are from their own. Think of the multitude of cultural differences in gestures, personal space, rules of etiquette, religious beliefs, attitudes, and so on. With all these differences influencing behavior, it would be rather amazing if there are any human characteristics, including the emotional expressions that are identical across all cultures.

Paul Ekman is considered the leading researcher in the area of the facial expression of emotion. This early article details his research, which was designed to demonstrate the universality of these expressions. While the authors acknowledged in their introduction that previous researchers had found some evidence that facial behaviors are determined by culturally variable learning, they argued that this evidence was weak and that expressions of basic emotions are equivalent in all cultures.

Several years prior to this study, Ekman and Friesen had conducted research in which they showed photographs of faces to college-educated people in Argentina, Brazil, Chile, Japan, and the United States. All the subjects from every country successfully identified the same facial expressions as corresponding to the same emotions. The researchers presented their findings as evidence of universality in these expressions. However, as Ekman and Friesen themselves pointed out, these findings were open to criticism, since members of the cultures studied had all been exposed to international mass media (movies, magazines, television), which is full of facial expressions. What was needed to prove the universality of emotional expression was a culture that had not been exposed to any of these things. Imagine how difficult (perhaps impossible!) it would be to find such a culture today. Well, even in 1971 it wasn't easy.

Ekman and Friesen traveled to the Southeast Highlands of New Guinea to find subjects for their study among the Fore people who existed then as an isolated Stone Age society. Many of the members of this group had experienced little or no contact with Western or Eastern modern cultures. Therefore, they had not been exposed to emotional facial expressions other than those of their own people.

## THEORETICAL PROPOSITIONS

The theory underlying Ekman and Friesen's study was that the specific facial expressions corresponding to basic emotions are universal. Ekman and Friesen stated it quite simply:

The purpose of this paper was to test the hypothesis that members of a preliterate culture who had been selected to ensure 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. (p. 125)

## METHOD

The subgroup of the Fore who were the most isolated were among those referred to as the South Fore. The individuals selected to participate in the study had seen no movies, did not speak English or Pidgin, had never worked for a Westerner, and had never lived in any of the Western settlements in the area. There were 189 adults and 130 children chosen to participate, out of a total South Fore population of about 11,000. For comparison, there were also 23 adults chosen who had experienced a great deal of contact with Western society through watching movies, living in the settlements, and attending missionary schools.

Through trial and error, the researchers found that the most effective method of asking the subjects to identify emotions was to present them with three photographs of different facial expressions and read a brief description of an emotion-producing scene or story that corresponded to one of the photographs. The subject could then simply point to the expression that best matched the story. The stories used were selected very carefully to be sure that each scene was related to only one emotion and that it was recognizable to the Fore

people. Table 1 lists the six stories developed by Ekman and Friesen. The authors explained that the fear story had to be longer to prevent the subjects from confusing it with surprise or anger.

**TABLE 1 Ekman and Friesen's Stories Corresponding to Six Emotions**

EMOTION	STORY
1. Happiness	His (her) friends have come and he (she) is happy.
2. Sadness	His (her) child (mother) has died and he (she) feels very sad.
3. Anger	He (she) is angry and about to fight.
4. Surprise	He (she) is just now looking at something new and unexpected.
5. Disgust	He (she) is looking at something he (she) dislikes; or he (she) is looking at something that smells bad.
6. Fear	He (she) is sitting in his (her) house all alone and there is no one else in the village. There is no knife, ax, 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).

(Adapted from p. 126.)

Forty photographs of 24 different people, including men, women, boys, and girls, were used as examples of the six emotional expressions. These photographs had been validated previously by showing them to members of various other cultures. Each photograph had been judged by at least 70% of observers in at least two literate Western or Eastern cultures to be representative of the emotion being expressed.

The actual experiment was conducted by teams consisting of one member of the research group and one member of the South Fore tribe, who explained the task and translated the stories. Each adult subject was shown three photographs (one correct and two incorrect), was told the story that corresponded to one of them, and was asked to choose the expression that best matched the story. The procedure was the same for the children, except that they only had to choose between two photographs, one correct and one incorrect. Each subject was presented with various sets of photographs so that no single photograph ever appeared twice in the comparison.

The translators were given careful training to ensure that they would not influence the subjects. They were told that there was no absolutely correct response and were asked to not prompt the subjects. Also, they were taught how to translate the stories exactly the same way each time and to resist the temptation to elaborate and embellish them. To avoid unintentional bias, the Western member of the research team avoided looking at the subject and simply recorded the answers given.

Remember that these were photographs of Western facial expressions of emotions. So, could the Fore people correctly identify the emotions in the photographs, even though they may never have seen a Western face before?

## RESULTS

First, analyses were conducted to see if there were differences between males and females or between adults and children. The adult women were found to be more hesitant to participate and were considered to have had less contact with Westerners than the men. However, no significant differences in ability to correctly identify the emotions in the photographs were found between any of the groups.

Tables 2 and 3 summarize the percentage of correct responses for the six emotions by the least Westernized adults and the children, respectively. Not all subjects were exposed to all emotions, and sometimes subjects were exposed to the same emotion more than once. Therefore, the number of subjects in the tables do not equal the overall total number of participants. All of the percentages were statistically significant except when subjects were asked to distinguish fear from surprise. When this situation existed, many errors were made, and, for one group, surprise was actually selected a significant 67% of the time when the story described fear.

**TABLE 2 Percent of Adults Correctly Identifying Emotional Expressions in Photographs**

EMOTION IN STORY	NUMBER OF SUBJECTS	PERCENT CHOOSING CORRECT PHOTOGRAPH
Happiness	220	92.3
Anger	98	85.3
Sadness	191	79.0
Disgust	101	83.0
Surprise	62	68.0
Fear	184	80.5
Fear (with surprise)	153	42.7

(Adapted from p. 127.)

Comparisons were made between the Westernized and non-Westernized adults. No significant differences were found between these two groups on the number who chose the correct photographs matching the emotion stories. There were also no differences found between younger and older children. As you can see in Table 3, the children appeared to perform better than the adults, but Ekman and Friesen attributed this to the fact that they only had to choose between two photographs instead of three.

**TABLE 3 Percent of Children Correctly Identifying Emotional Expressions in Photographs**

EMOTION IN STORY	NUMBER OF SUBJECTS	PERCENT CHOOSING CORRECT PHOTOGRAPH
Happiness	135	92.8
Anger	69	85.3
Sadness	145	81.5
Disgust	46	86.5
Surprise	47	98.3
Fear	64	93.3

(Adapted from p. 127.)

## DISCUSSION

Ekman and Friesen did not hesitate to draw a confident conclusion from their data: "The results for both adults and children clearly support our hypothesis that particular facial behaviors are universally associated with particular emotions" (p. 128). This conclusion was based on the fact that the South Fore had no opportunity to learn anything about Western expressions and, thus, had no way of identifying them unless the expressions were universal.

As a way of double-checking their findings, the researchers videotaped members of the isolated Fore culture portraying the same six facial expressions. Later, when these tapes were shown to college students in the United States, the students correctly identified the expressions corresponding to each of the emotions.

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. (p. 128)

The one exception to their consistent findings, that of the confusion subjects seemed to experience in distinguishing between expressions of fear and surprise, Ekman and Friesen explained by acknowledging that there are certainly some cultural differences in emotional expression, but this did not detract from the preponderance of evidence that nearly all the other expressions were correctly interpreted across the cultures. They speculated that fear and surprise may have been confused "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." (p. 129).

## IMPLICATIONS OF THE RESEARCH

This study by Ekman and Friesen served to demonstrate scientifically what you already suspected: that facial expressions of emotions are universal. However, you might still be asking yourself, "What is the significance of this information?" Well, part of the answer to that question relates to the nature-nurture debate about which human behaviors are present at birth and which are acquired through learning. Since facial expressions for the six emotions used in this study appear to be influenced very little by cultural differences, it is possible to conclude that they must be innate, that is, biologically *hard-wired* in at birth.

Another reason behavioral scientists find the notion of universal emotional expressions interesting is that it addresses issues about how humans evolved. In 1872, Darwin published a now-famous book called *The Expression of Emotion in Man and Animals*. He maintained that facial expressions were adaptive mechanisms that assisted animals in adapting to their environment and, therefore, increased their ability to survive. The idea behind this was that if certain messages could be communicated within and across species of animals through facial expressions, survival would be enhanced. For example, an expression of fear would provide a silent warning of imminent danger from predators; an expression of anger would warn less dominant members of the group to stay away from more powerful ones; and an expression of disgust would communicate a message of, "Yuck! Don't eat that, whatever you do," and prevent a potential poisoning. These expressions, however, would do the animals no good if they weren't universal among all the individuals making up the various species. Even though these expressions may now be less important to humans in terms of their survival-enhancement value, the fact that they are universal among us would indicate that they have been passed on to us from our evolutionary ancestors and have assisted us in reaching our present position on the evolutionary ladder.

A fascinating study demonstrated this *leftover* survival value of facial expressions in humans. The researchers (Hansen & Hansen, 1988) reasoned that if facial expressions could warn of impending danger, then humans should be able to recognize certain expressions, such as anger, more easily than other, less threatening expressions. To test this, they presented subjects with photographs of crowds of people with different facial expressions. In some of the photographs, all of the people's expressions were happy except for one that was angry. In other photographs, all of the expressions were angry, except for one that was happy. The subjects' task was to pick out the face that was different. The amount of time it took the subjects to find a single happy face in a crowd of angry faces was significantly longer than when they were to search a crowd of happy faces for a single angry face. Furthermore, as the size of the crowds in the photographs increased, the time for subjects to find the happy face also increased, but finding the angry face did not take significantly longer. This and other similar findings have indicated that humans may be biologically programmed to respond to the information provided by certain expressions better than others because they offered more survival information.

## RECENT APPLICATIONS

Other more recent studies in various areas of research have relied on Ekman's early findings in attempting to improve our understanding of children and adults with developmental or learning disabilities. One such study found that children diagnosed with autism (a pervasive developmental disorder marked by language deficits, social withdrawal, and repetitive self-stimulation behaviors) appear to have difficulty recognizing the facial expressions that correspond to basic emotions (Bolte & Poustka, 2003). This difficulty was even more pronounced in families with more than one autistic child, and may help explain why many autistic individuals typically show difficulty interpreting emotional responses from others.

Ekman's research on facial expressions has also played a fundamental role in cross-cultural psychology research. David Matsumoto, one of the leading researchers in this area, has made frequent use of Ekman's concepts in his studies of intercultural interpretations of emotions and behavioral expectations (e.g., Matsumoto, Kasri, & Kookan, 1999). In addition, Matsumoto and Ekman have collaborated with other researchers on a study of cross-cultural gender differences in facial expressions (Biehl et al., 1997).

The influence of Ekman's research, however, is not limited to humans. Ekman's 1971 study has been cited in research on emotions in *farm animals* (Desire, Boissy, & Veissier, 2002). These researchers suggest that the welfare of farm animals depends, in part, on their emotional reactions to their environment. When individual animals feel in harmony with their environment, their welfare is maximized; however, "any marked deviation from the state, if perceived by the individual, results in a welfare deficit due to negative emotional experiences" (p. 165). Clearly one group of farm animals feels very harmonious with their environment because, as the ad campaign says, "great cheese comes from happy cows, and happy cows come from California."

Finally, another study citing Ekman's 1971 article attempted to shed light on exactly how one specific facial feature, the eyebrows, contributes to facial recognition (Sadr, Jarudi, & Sinha, 2003). Previous research had centered more on the eyes and mouth, but these researchers found that the eyebrows may be more important than the eyes themselves. The authors concluded "that the absence of eyebrows in familiar faces leads to a very large and significant disruption in recognition performance. In fact, a significantly greater decrement in face recognition is observed in the absence of eyebrows than in the absence of eyes" (p. 285). So, if you are ever in need of an effective disguise, be sure to cover your eyebrows!

## CONCLUSION

During the two decades following the early cross-cultural research on emotional expressions, Ekman has continued his emotion research both individually and in collaboration with Friesen and several other researchers. Within this body of work, many fascinating discoveries have been made. One further example of Ekman's research involved what is called the *facial feedback theory* of emotional expressions. The theory states that the expression on your face actually feeds information back to your brain to assist you in interpreting the emotion you are experiencing. Ekman tested this idea by identifying the exact facial muscles involved in each of the six basic emotions. He then instructed subjects to tense these muscles into expressions resembling the various emotions. When they did this, Ekman was able to measure physiological responses in the subjects that corresponded to the appropriate emotion resulting from the facial expression alone, and not from the actual presence of the emotion itself (Ekman, Levensen, & Friesen, 1983).

Ekman has also extended his research into the area of deception and how the face and the body *leak* information to others about whether someone is telling the truth. In general, his findings have indicated that people are able to detect when others are lying at a slightly better than chance level when observing their facial expressions. However, when allowed to observe another's entire body, subjects were much more successful in detecting lies, indicating that the body may provide better clues to certain states of mind than the face alone (see Ekman, 1985, for a complete discussion of this issue).

Ekman and his associates have provided us with a large literature on the nonverbal communication provided by facial expressions (see Ekman, 2003). And research in this area continues. There is little doubt that the studies will continue until we are successful in accomplishing the goal that was the title of Ekman and Friesen's 1975 book *Unmasking the Face*.

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