

facts

the science of
facial expressions

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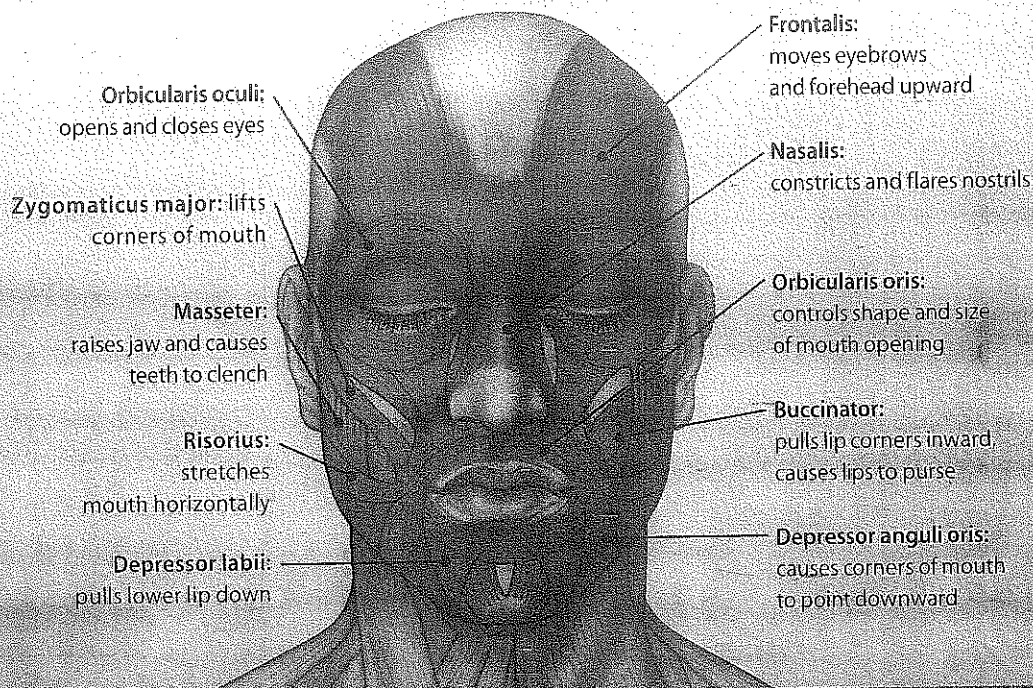
Facial Expressions

Chances are, you're not very good at faking a smile. You can raise the corners of your lips into a neat grin—as one does for the camera—and you can probably tighten your eyelids a bit to enhance the effect. But unless you're amused, excited, grateful, relieved, or just plain

happy, you probably can't pull your cheeks up and your eyebrows down to form a smile that looks genuine. No more than one in ten people can voluntarily control the outer orbicularis oculi, the muscles surrounding the eye sockets, with that much precision.

 **Ask Question:**
Check your understanding by asking and answering a question about fake smiles.

Commonly Used Facial Muscles



 **Analyze the Diagram** The diagram shows 10 of 43 facial muscles. Which muscles do you think you use when you smile? Which do you use when you frown?

Key Vocabulary

- **enhance** *v.*, to improve
- **precision** *n.*, accuracy

In Other Words

genuine real, sincere
voluntarily willingly

Paul Ekman has spent forty years watching thousands of people try. An **emeritus** professor of psychology at the University of California at San Francisco, Ekman is a world authority on facial expressions. He is also extraordinarily skilled at faking them. In the course of cataloging more than ten thousand human expressions, he has taught himself to flex each of his forty-three facial muscles individually. He can even wiggle his ears one at a time. "If only they had an Olympic event for facial athletes," he says. 📺

Ekman may never win a gold medal, but he has no shortage of admirers. In recent years, as the war on terrorism **has escalated**, he and his colleagues have taught hundreds of police officers, judges, airport security officers, and FBI and CIA agents **to size up** their suspects and to read clues in their facial expressions. He is now an adviser for the Department of Defense, which is developing computer technology that can scan and analyze facial movements on videotape. 📺



In Washington state, Yi Zhou and other researchers demonstrate facial scanning, a technology that can be used to check personal identity.

Global Expressions

Charles Darwin was convinced that facial expressions don't **vary** from culture to culture, but by the 1950s most social scientists had come to believe the opposite. To see who was right, Ekman traveled to the highlands of Papua New Guinea in 1967 and visited the Fore people, who had never been exposed to movies, television, magazines, or

📺 Ask Questions
Check your understanding of Paul Ekman by asking and answering questions about him.

📺 Ask Questions
What questions can you ask yourself about Ekman's accomplishments?

Key Vocabulary
• vary v. to differ

In Other Words

emeritus retired with distinction
has escalated has become more intense
to size up to evaluate

many outsiders. **At** When Ekman showed the Fore photographs of faces with various expressions, they interpreted them exactly as Westerners would. A sad face, for instance, made them wonder if the person's child had died.

Similar studies by other scientists have since shown that facial expressions across the globe fall roughly into seven categories: sadness, surprise, anger, **contempt**, disgust, fear, and happiness.

Whether faces can express any more than these seven emotions is a matter of some debate. There could be specific expressions for contentment, excitement, pride, relief, guilt, and shame, Ekman says, but they have yet **to be delineated**. Individual elements of each expression can occur in varying intensities or may be **missing** altogether. A look of mild surprise can be shown by the eyes alone, for instance, if the mouth doesn't move. Emotion usually leads to an expression, but studies have shown

that the process can also work in reverse: If you force your face to look sad or angry, the rest of your body will react as well, and you may involuntarily begin to feel those emotions. A look of anger will make your heart speed **up** and your blood vessels dilate until your skin turns red; a look of fear can make your hands cold and clammy and your hairs stand on end; a look of disgust can make you **nauseated**.

These internal responses may last a full minute or more—far longer than the expressions themselves, which last no more than two or three seconds. When people try to hide their emotions, their expressions may flash for one-fifteenth to one-twentieth of a second—just long enough for others to see them.

After that, people can wipe away their “microexpressions,” as Ekman describes them. **What about** a person's voice? It is much harder to remove all traces of feeling from the voice. That's why Ekman tells police to keep their suspects talking.

47 **Contempt** and **disgust**
Why do you think Ekman sought out a culture that had not been exposed to modern media?

Access Vocabulary
The prefix *micro-* means “very small.” It comes from a Greek word meaning “small.” Knowing this, how would you define the word *microexpressions*?

In Other Words

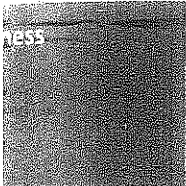

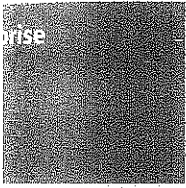

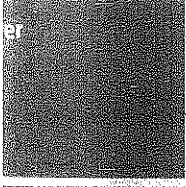

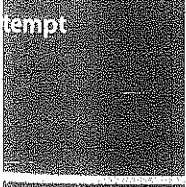

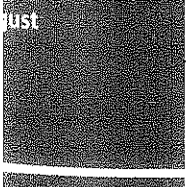

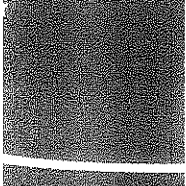

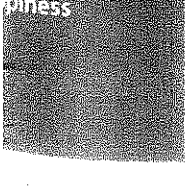


contempt disrespect
to be delineated to be identified
nauseated feel sick to your stomach

Science Background

Charles Darwin (1809–1882) was the English scientist who first described the theory of biological evolution. His ideas are often used to help understand which human traits are natural and which are caused by culture.




Categories of Facial Expressions

Expression	Description
	 The eyelids droop as the inner corners of the brows rise and, in extreme sadness, draw together. The corners of the lips pull down, and the lower lip may push up in a pout.
	 The upper eyelids and brows rise, and the jaw drops open.
	 The lower and upper eyelids tighten as the brows lower and draw together. Anger raises the upper eyelids. The jaw thrusts forward, the lips press together. The lower lip may push up.
	 This is the only expression that appears on just one side of the face: One half of the upper lip tightens upward.
	 The nose wrinkles and the upper lip rises while the lower lip protrudes .
	 The eyes widen and the upper lids rise, as in surprise, but the brows draw together.
	 The corners of the mouth lift in a smile. As the eyelids tighten, the cheeks rise and the outside corners of the brows pull down. 

In Other Words

droop hang down

protrudes sticks out

 **Ask Questions**
Ask yourself questions that would improve your understanding of the categories of facial expressions.



Monitor Comprehension

Explain

Why is it important for police to keep their suspects talking?
Explain your reasoning.

Expressional Analysis

Ekman's weeklong classes teach law enforcement officers not only to analyze expressions but also to interpret voices and gestures, ask questions, and build a rapport with suspects. He shows his students how to recognize the basic emotions and spot asymmetries—a crooked smile, for instance, or a half-closed eye—that are often a sign of conscious lying. The techniques work best when a suspect is telling a lie for the first time. “The more often you tell a lie, the more likely you will come to believe it is the truth,” Ekman says. That’s why it’s important that police and security officers learn to spot a liar on first contact. “By the time something gets to court, the lie has been rehearsed.”

No matter how skilled a person becomes at reading the clues, it’s always easier to recognize when someone is lying than when he is telling the truth. And some lies are easier to catch than others. A polite lie—when a person tells her host that dinner was delicious or remarks on how much he likes a friend’s new

suit—is harder to spot than one that is laced with emotion. When people lie about whether they believe in the death penalty, for instance, they are not so good at hiding their true feelings. High-stakes lies, including whether one is engaged in illegal activity, for instance, are likewise difficult to cover up.

72 Cause and Effect
What situation could result if a police officer doesn’t notice if a suspect is lying?

The Science of Smiling



Which is real? Paul Ekman demonstrates a polite smile (left) and a true smile (right).

The computer system that Ekman is helping the Department of Defense develop will be able to read all ten thousand facial movements involved in emotion. The system is

In Other Words

build a rapport develop a good relationship
asymmetries things that do not appear equal or balanced

laced with emotion full of emotion

High-stakes lies Lies that have serious consequences

To cover up to hide

a few years from completion, but even if it's successful, Ekman would put **his money on a human being** if he had to choose between the two. "Human beings have a complex computer **sitting up** there in their brains," he says. "With enough training, humans can do very complex evaluations very quickly." They also don't have to wait for a suspect to be videotaped and thus get more time to practice lying.

When Ekman trains police and security officers, whether in person or with a version of his program on CD, it takes them only about an hour to learn to recognize microexpressions. But some are far more skilled than others. As a group, United States Secret Service agents tend to be better than average—a third of those Ekman tested could distinguish a lying face from a truthful one about 80 percent of the time. However, psychologists, police officers, CIA and FBI agents, lawyers, and students tend to do little better than **chance**.

Ekman's colleague Maureen

O'Sullivan has found that a select few can become nearly 100 percent accurate at catching liars: Of the more than thirteen thousand people she has tested in the past ten years, thirty-one were "wizards," as she calls them. Wizards see the whole picture, not expression alone. "Some people, when they're lying, don't show anything on their faces," O'Sullivan explains. **8** Wizards tend to be unusually intelligent, but they also have plenty of practice and are eager to **hone their skill**. "You have to have the basic talent but also the motivation to work at the skill," she says. Although the majority of police officers are not that good at catching liars, her small group of wizards includes unusually **savvy** cops, as well as lawyers, dispute mediators, and therapists who have taken their natural people instincts far beyond the norm. **9**

Ekman's next challenge is to identify more specific expressions of anger. Are there **subtle** facial movements that separate, say, **aggression and petulance** or

8 Ask Questions
Ask yourself a question that would help build your understanding of this section.

9 Access Vocabulary
Some English words are actually shortened versions of a longer word. What word do you think the term *norm* comes from? How does this help you figure out the meaning of the expression "beyond the norm"?

Key Vocabulary

subtle *adj.*, hard to notice

In Other Words

put his money on pick with absolute certainty
chance random guessing
hone their skill improve their ability
savvy clever
aggression and petulance angry and impatient behavior

rage and plain annoyance? Law enforcement agencies are eager for the answer—particularly if Ekman can identify any expressions or body language that signal a forthcoming attack. Even if they exist, Ekman

probably won't publicize his findings—otherwise, criminals will just learn to better mask their intentions. "We will make this available for law enforcement and security agents alone," he says.

Cause and Effect
What might be an effect if Ekman publicizes all of his findings about facial expressions?

ANALYZE Face Facts: The Science of Facial Expressions

1. **Summarize** What factors influence a person's ability to tell if someone is lying?
2. **Vocabulary** How does understanding differences in facial expressions **enhance** people's ability to communicate? Give examples.
3. **Analyze Literature: Cause and Effect** How do you think Ekman's findings about facial expressions could affect our everyday lives? List three possible effects in a chart. Then discuss your effects with a partner. Explain your reasoning.

Cause: Understanding how to read facial expressions

Effect:

4. **Reading Strategy Ask Questions** Choose one passage in which you asked and answered a question. Explain to a partner how asking and answering the question helped you understand the text.

Return to the Text

Reread and Write How do you think Professor Ekman would answer the question "What does it really mean to communicate?" Reread the selection, noting specific ideas and information. Then write a paragraph that answers the question.

In Other Words

to better mask their intentions to become better at hiding what they plan to do