

# CHAPTER **Five**

## The Face

### 5.1 What Is Covered and Why

Character faces are becoming increasingly important as game graphics capabilities and processing power allow for more visibility of and subtlety in facial expression. What was not possible 20 years ago (when conveying a smile or frown in a sprite (a player character image on-screen during gameplay) was an achievement), is now limited only by the designer’s imagination and abilities. Subtle mingling of fear and excitement upon an enemy’s face, unmistakable delight of an ally at seeing the player-character—these emotions and more are now possible. This is wonderful insofar as the social power of games is concerned. The face is one of the most important human communication channels.

This chapter introduces some of the social cues people are looking for in one another’s faces and offers ways to incorporate them intelligently and appropriately into the design of characters. Game examples are drawn from *The Legend of Zelda: The Windwaker* and *Super Monkey Ball 2*.

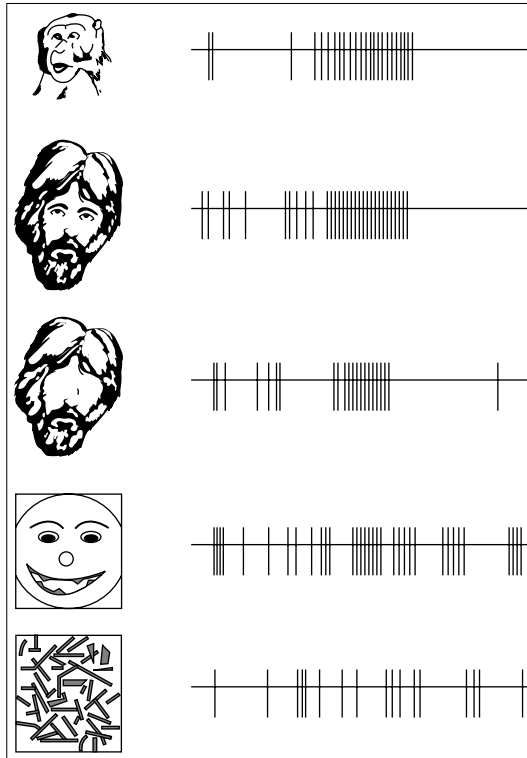
### 5.2 The Psychological Principles

Reading faces is a fundamental aspect of social interaction. There is evidence that there are specific areas of human (and primate) brains devoted to the processing of faces (see Figure 5.1).

#### 5.2.1 *What We Look for in Faces and Why*

##### **Expressions**

When interacting, people watch the play of expressions upon the other person’s face—the raising or lowering of an eyebrow, crinkles forming around the eyes, or a subtle droop at the corners of the mouth. Researchers who study the movement

FIGURE  
5.1

Responses of a neuron in a monkey's area IT to various stimuli. This neuron responds best to a full face, as shown by its response to monkey and human faces in the top two records. Removing the eyes or presenting a caricature of a face reduces the response. This neuron does not respond to a random arrangement of lines. (From Bruce, Desimone, and Gross 1981.)

of these muscles have isolated 46 *action units* involved in forming expressions (Ekman, Friesen, and Hagen 2002). Figure 5.2 shows the action units identified for the brows and forehead. Specific combinations of these action units lead people to say that a particular emotion is being expressed. For example, the combination of action units 1 and 2 leads to a label of “surprise.” Ekman and his colleagues painstakingly catalogued the individual facial muscles and their combinations and studied how they are used to convey basic emotions such as fear, anger, happiness, and sadness. They then investigated whether people from different cultures identify the same emotions from their database—is a sad face recognized as sad across the globe? The answer seems to be yes.

Why is this the case? Darwin's ground-breaking work on facial expression suggested that human emotional expressions evolved out of involuntary physical reactions that can also be observed in other animals. Today psychologists know that there are some cultural differences in emotion display patterns, but most

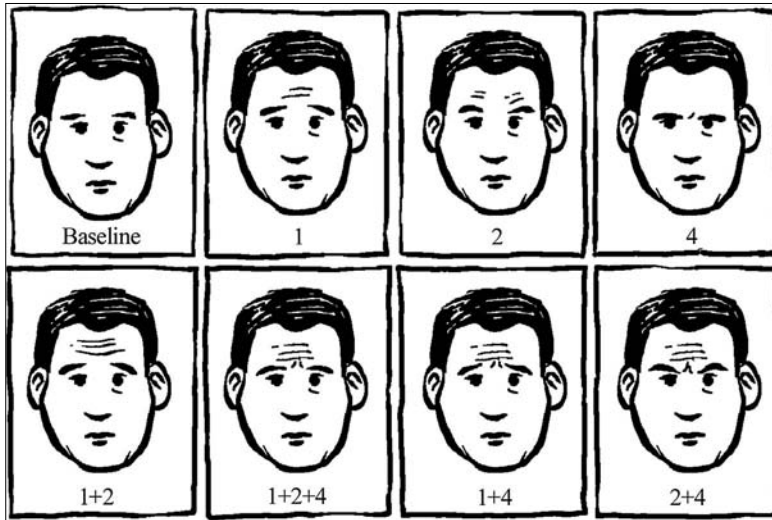


FIGURE  
5.2

*Action units for the brow and forehead.*

researchers agree on the universality of at least four basic emotions (see Figure 5.3 for illustrations of some forms of these expressions):

- anger (assertion),
- fear (aversion),
- happiness (satisfaction), and
- sadness (disappointment).

Beyond expressing emotions, the movement of the muscles of the face also contributes meaning to conversation. For example, raised eyebrows can be used to emphasize words or phrases in conversation, or to indicate that one is paying attention as another speaks (see Figure 5.4).

## Gaze

When watching a person's face, people are also paying close attention to gaze. Where the other looks and whether and for how long they make eye contact, provide important social information. Timing and direction of gaze can indicate

- dominance or submissiveness (patterns of holding or avoiding direct eye contact),
- where a person's attention is at the moment,
- flirtation,
- interest in beginning a conversation (or desire to avoid one),

FIGURE  
5.3

Four basic emotions: anger, fear, happiness, and sadness.

- an invitation for one's conversation partner to take a turn in the dialogue,
- active listening, and
- pondering of a point.

As with expression, patterns of gaze can vary depending upon culture or subculture. For example, lack of sustained mutual gaze might be interpreted as indifference or rudeness by an American person and as politeness by a Japanese person.

### 5.2.2 *Social Uses of Reading Expression and Gaze*

#### **Social Learning**

If you needed to repair something complex for the very first time, would you prefer to do it alone, learning through a combination of manuals and trial and error? Or, would you want to work with another person who was already a repair expert, watching and learning from what they did?

Most likely you would want to do the latter. It is much easier to learn how to do something new with another person who is an expert to watch (see Figure 5.5).



FIGURE  
5.4

Raised eyebrows can be used in conversation to emphasize a point, or to show that one is listening attentively.



FIGURE  
5.5

Learning a new task is often much easier when we can watch someone else do it first.

Psychologists have demonstrated that this is a powerful part of being human—a person could never learn all he or she needs to know about life through sheer trial and error. Instead, people learn rapidly and efficiently by watching one another and learning from each others' mistakes and successes. (See [Bandura 1977] for an overview of social learning theory.) The face is one place people look to learn.

What do you think the person in Figure 5.6 sees? What might you do if you were in the same room with this person? You would probably brace yourself for something bad and would look up to see the potential threat.

When people watch another's face to learn about what is happening, they are drawing conclusions about

- where attention is, by following the other's gaze, and
- what the other's emotional reaction is, by reading facial expression.

People put these clues together to help guide quick decisions about what to do to be ready for what may be coming next. Social learning is the ongoing process of watching other peoples' attention shifts, actions, and reactions. The face plays an important role in this process.

FIGURE  
5.6



What is this boy so horrified by? If you saw him looking above you with this expression, you would probably look for yourself to see what was so scary.



FIGURE  
5.7

Link (from *Zelda: The Windwaker*) has an expressive face with large eyes that make gaze tracking easy. Image courtesy of Nintendo.

Players can engage in social learning from well-designed characters just as they do with people. In *The Legend of Zelda: The Windwaker*, the player's character gives hints about what to do and where to go with his large and expressive eyes (see Figure 5.7). For example, in Clip 5.1 on the DVD, Link's gaze is tracking on the lantern that the player must swing from to get across the room. Such subtle cues help guide beginners, or players struggling with the next insight, into the right actions intuitively, avoiding the need for overt hints from guide characters or from the interface itself.

### Empathy and Emotional Feedback with Faces

As people scan others' faces for emotional expressions, their own faces involuntarily respond. Mirroring the expression on another's face with your own helps establish connection and demonstrates empathy. During a conversation with someone retelling a sad event, for example, you may mirror the grief in the face of the teller. Listening to a funny story, you may put on a happy expression at the moment when the teller describes a happy surprise, showing that you are emotionally on board for the tale (see Figure 5.8).

Curiously, this mirroring can have an impact on our own emotions (see Figure 5.9). Making a face seems to trigger the emotion that is "faked." The *facial feedback hypothesis*, first proposed by Darwin, has been tested in modern times with a rather ingenious study. Researchers had participants hold a penlike object in their mouth, either with their lips wrapped fully around it or just clenched in the teeth with the mouth open, which triggered use of the muscles that form a smile (see Figure 5.10). The participants were told they were testing ways for disabled people to hold writing utensils. Both sets of people rated how funny the same

FIGURE  
5.8



Learning social emotion display is a part of childhood development. Some of these children are mirroring the emotions described in the story the teacher is reading.

FIGURE  
5.9



Try imitating each of these faces. Did you notice a shift in your own mood in either case? If so, you experienced the *facial feedback hypothesis*.



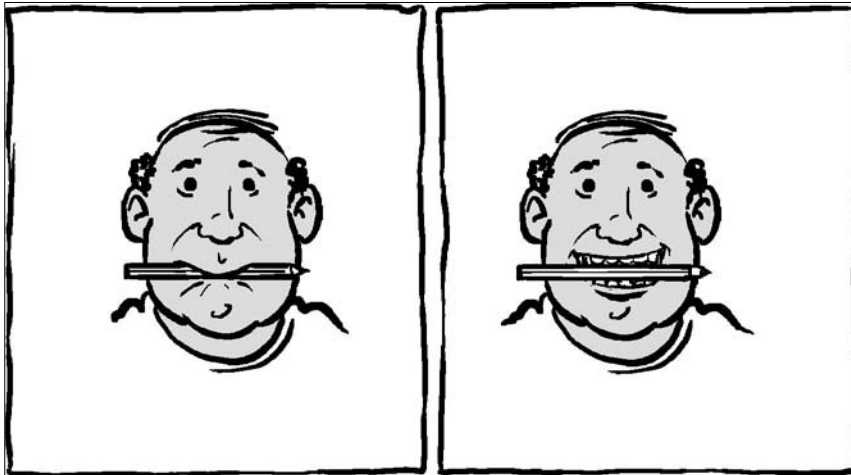


FIGURE  
5.10

Participants in a study who held a penlike object in their mouth in a way that forced them to use their smile muscles rated cartoons as funnier than those who held the object with pursed lips.

cartoons were—those who had a “smile” on their faces rated the cartoons as funnier (Strack, Martin, and Stepper)!

Given the fact that people unconsciously mimic facial expressions when they are sympathetic, and that this can cause an emotional feedback loop, the player-character’s face becomes an important tool in a designer’s arsenal for crafting the right flow of emotion for players.

Good character designers direct player emotions by using player-characters to underscore desirable feelings (such as triumph or suspense) and to minimize undesirable ones (such as fear or frustration). For example, in *Super Monkey Ball 2*, the player-characters show intense joy when they succeed, and have ongoing cheer and energy-level which make this party game even more fun (see Figure 5.11). In Clip 5.2, the player-character dances while the player selects which obstacle course to tackle next. In Clip 5.3, the player-character celebrates after a win (the cues are especially noticeable in the instant replay at the end of the clip).

In *The Legend of Zelda: The Windwaker*, the designers also help guide and shape the player’s emotions through Link’s reactions to what is happening. In Clip 5.4 Link is shot out of a cannon by the pirate (see Figure 5.12). His expressions shift from fear to determination as the countdown takes place. During game play, Link’s expression is one of resolve and courage, regardless of the obstacles that he faces.

### Social Relationships and the Face

The expressions on human faces are not simply automatic reflections of internal feelings nor unconscious imitations of others—they are also consciously controlled social signals that help people connect. Researchers have demonstrated that

FIGURE  
5.11



The player-characters in *Super Monkey Ball 2* have clear and engaging emotional reactions to what is happening in game play. ©Sega Corporation. All rights reserved. Reprinted with permission.

FIGURE  
5.12



Link prepares to be shot from the cannon. See Clip 5.4 to watch the sequence. Image courtesy of Nintendo.

humans use emotional expressions much more when in the presence of other people (see Figure 5.13). For example, a study of the expressions on the faces of Olympic winners at the moment of victory showed that they generally wore a smile only when they knew others were watching their expressions. The smiles that they put on for others were genuine (not “fake” smiles) but were nonetheless replaced with other expressions in less public moments. Intentionally displayed facial expressions help convey intentions and relationships to others and fulfill social obligations to have certain feelings at certain times (for example, the persistent smile of the flight attendant—see Hochschild, 2003).

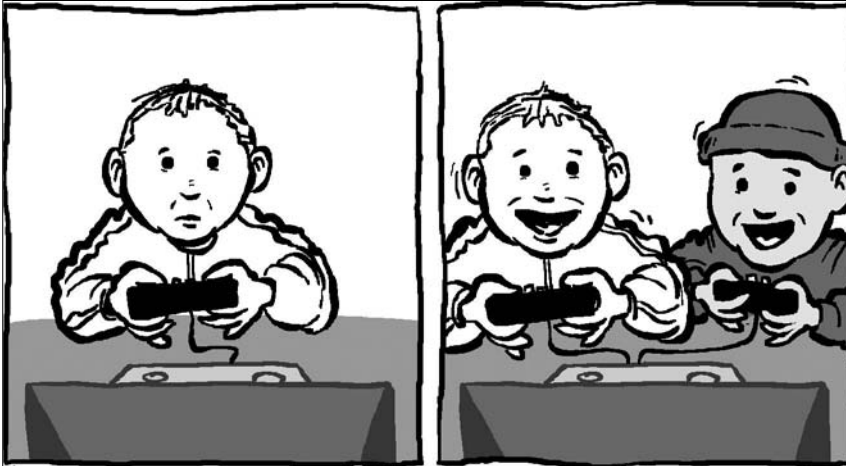


FIGURE  
5.13

Researchers have demonstrated that people use facial expressions more when others are present.

Some facial expressions that are used to communicate social intent include

- friendly or suspicious expressions (an important first impression factor, as discussed in Chapter 1),
- dominant or submissive facial reactions (also mentioned in Chapter 1), and
- ongoing facial reactions to shared experiences and stories (see Figure 5.14). The degree and manner of empathetic emotions in a person's face helps tell another that he or she is connected and on the storyteller's team. (The ways that social roles shape the use of emotional expressions will be discussed in greater detail in Part IV.)



FIGURE  
5.14

The designers of *The Legend of Zelda: The Windwaker* use faces to forge strong connections between characters. Image courtesy of Nintendo.

Great character designers make use of NPC (nonplayer-character) reactions to the player's character to help build connection to game goals and to show the player her social role in the gameworld. In *The Legend of Zelda: The Windwaker*, Link's initial social relationships to three women—his sister (Figure 5.15), his grandmother (Figure 5.16), and a pirate girl (Figure 5.17)—help to quickly and intuitively set up the player's game goals and play style.

Link's little sister is dear to his heart and relies on him entirely. Her face is adoring and trusting (see Figure 5.15). In Clip 5.5, she is stolen from him by an evil bird. The player's motivation to save her is enhanced by the emotional bonds created through the use of facial expressions.

Link's grandmother is very proud of him, and she acts as a slightly smothering mother figure (see Figure 5.16). In Clip 5.6 she gives him the clothes that mark his coming of age, and his reluctance and irritation is classic adolescent behavior.

Petra the Pirate is a bit patronizing to Link, but helps him along (see Figure 5.17). In Clip 5.7, she treats him as a bossy older sister might.

The use of facial expressions as a rich source of information about the NPC's relationship to the player-character is apparent in each clip. These social expressions are a subtle and intuitive way to help guide the player's motivations and intentions.

FIGURE  
5.15



Link's little sister gives him her favorite toy as a birthday gift. Image courtesy of Nintendo.

FIGURE  
5.16

Link's grandmother is supportive and kind.

FIGURE  
5.17

Petra the Pirate makes fun of Link for saying goodbye to his grandmother. Images courtesy of Nintendo.

## 5.3 Design Pointers

Here are some recommendations for taking game characters further with face-work:

### 5.3.1 Give the Character's Face the Right Mobility

Visual design and animation style should take into account the social messages a designer wants to communicate. If you want to use gaze to teach the player, consider making a character's eyes larger, with high contrast between pupils and whites of eyes, so that gaze direction is easy to determine (like Petra in Figure 5.18). If you want the player to connect emotionally to a character's

FIGURE  
5.18



The faces of characters in *The Legend of Zelda: The Windwaker* have simple, exaggerated features that successfully convey subtle emotions. Here, Petra has decided to send Link over to the island with her cannon, but she hasn't let him in on the joke. Image courtesy of Nintendo.

face, make sure that the key expressions—surprise, anger, happiness, and sadness—are quite legible for the player. Your facial modelers and animators may want to take a look at Ekman and Friesen's *Facial Action Coding System* (2002) to make sure you have the right range of motion for the emotions you want to convey. You will also probably want to test how readable expressions are in game-play conditions when the player is focusing on many things at once.

### **5.3.2 Use the Face to Telegraph Intention**

To help guide the player, consider using the technique from *The Legend of Zelda: The Windwaker* presented earlier on page 149 (also used by *Max Payne* and a handful of other games): give the player clues about what is active in the environment through gaze (see Figure 5.19).

### **5.3.3 Use the Player-Character's Face to Inspire and Control Player Emotions**

You can influence the player's emotions by giving the player-character strong positive reactions to happy events and calm and determined reactions to adversity. Think about the emotions you want to enhance or minimize for players when crafting the player-character's emotional responses (for example, the look of grim determination on the monkey's face in Figure 5.20).

### **5.3.4 Use NPC Faces to Enhance Social Relationships with the Player**

Armed with a plan for the relationships the player-character has with each NPC in your game (for example, by creating a relationship diagram as



FIGURE  
5.19

Consider using the player-character's gaze to show the player where to focus. Image courtesy of Nintendo.



FIGURE  
5.20

The player-character vows to thwart the evil Dr. Badboon (*Super Monkey Ball 2*). ©Sega Corporation. All rights reserved. Reprinted with permission.

discussed in Chapter 2), you can map out what sorts of feelings each NPC would have toward the player, at any given moment in the game. Then you can craft the NPCs' facial expressions to show how they feel, evoking reactions from the player to help drive and motivate game play (see Figure 5.21). These emotions might be positive (e.g., nurturing a sister) or negative (e.g., being goaded by a bossy pirate)—both types of emotion can support a player's motivation through relationship-based reactions.