CHAPTER Six

The Body

6.1 What Is Covered and Why

Bodies reveal a wealth of information about people and their relationships. Designers have far more options for range and subtlety in character movement today with better animation tools and more powerful platforms. Although character animators do focus a great deal of attention on the body language of individual characters, there is still little consideration of how characters move in relation to one another. This chapter examines some of the social messages bodies convey, with examples from games that make use of these cues in characters—ICO, SSX™ 3, and There. The chapter concludes with tips for taking advantage of body language in character design. The chapter also includes an interview with one of the designers of There about the forward-thinking choices made in designing the player avatars for this highly social environment.

6.2 The Psychological Principles

Studying human movement and its place in social relations is not an easy task. Until recently, there were no adequate technologies for recording and systematically analyzing motion. Even with these tools in hand, it is difficult to translate insights about holistic impressions of personality or social connection into quantifiable and testable predictions. This predicament is not improved by the fact that most people are dimly, if at all, aware of the incredible impact of bodies in social interaction. Ask the average person if they think body language plays a big part in their assessment of others, and they are likely to say no, even when research results show that they are sensing and making decisions based upon body cues (Nass, Isbister, and Lee 2000).

Body cues have a pervasive influence on social relationships and are therefore an important part of crafting truly engaging game characters that feel lifelike and that evoke social reactions from players. This chapter will present some of what has been unearthed in this still-evolving area of social psychology.
6.2.1 Bodies Show Relationship

Interpersonal Distance and Touch

One way to begin considering how bodies work in social interaction is to consider what *proximity* (how close people are together when they interact) says about relationship. Consider Figures 6.1, 6.2, and 6.3 for a moment. Most people guess that the first pair are colleagues or new acquaintances. The second pair tends to look like more familiar friends, and the third pair like a couple. Something as simple as how close people stand together has a profound affect on what they are communicating about their relationship. Edward Hall, a well-known anthropologist, made observations of four zones of interpersonal space in U.S. social contexts:

- **Public distance.** Standing more than 12 feet apart. At this distance, it is easy to see everyone’s full body. Typically, people will slightly exaggerate their expressions and movements so that they are easy to interpret.

- **Social distance.** Standing 4 to 12 feet apart. This is the zone that most people hover within at parties—the closer they stand within this range, the better they probably know one another.
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How about these people?

How about the relationship between these two?

How about these people?
• **Personal distance.** Standing 18 inches to 4 feet apart. At this distance, it is easy to read subtle facial expressions. This is the distance that people use for more private conversations.

• **Intimate distance.** Less than 18 inches apart. This allows the people to easily touch and even to smell one another.

As was mentioned in Chapter 3, social distances vary depending upon culture and subculture, but the principle holds true: people can tell very quickly by the distance between people how likely it is that they are already in a close relationship. Types of touch also contributes to how people perceive relationships (see Figure 6.4). Some key purposes of touch include:

• **Function.** Touch as part of a task, such as a doctor’s examination or a coach clarifying a movement.

• **Social ritual.** Rituals such as handshakes or cheek kisses.

• **Friendship building.** Touches that show care and liking for another, such as a pat on the shoulder or a hug.

• **Intimacy.** Touch that expresses sexual interest and/or emotional connection.

**FIGURE 6.4**

Touch communicates social connection.
In ICO, the player-character (the young boy carrying the stick) finds a trapped princess very early on in game play. From this moment forward, the player takes care of her. The princess (Yorda), is not really able to defend herself and is not as agile as the player-character. She must be led by the hand to ensure that she tags along, and she needs help over obstacles. When the player battles the shadows that threaten her, she will stay close by (within social distance). (See Figure 6.5 and Clip 6.1 to observe some of their interaction in game play.) Many players of this game have remarked upon the emotions created by Yorda’s dependence upon them. This dependence is expressed almost entirely through body language. By keeping the two characters close, and by using touch as part of game play, the designers build a powerful connection between the player and Yorda.

Imitation
Another way people display relationship through bodies is imitation. Without realizing it, people often unconsciously mimic the postures and movements of those around them (Figure 6.6). Certain circumstances evoke this behavior:

- **When the other person is more dominant.** People tend to imitate those who have more social influence than they do.
- **If seeking assistance.** If a person needs something from another, she or he will begin to adapt the other’s poses when making a request.
Gesture imitation happens in many everyday social contexts; becoming aware of it can help reveal underlying social structures.

- *When absorbed in conversation with someone.* Researchers have noticed that gesture synchrony happens more when people are highly engaged with an interaction.

People tend to avoid imitating someone’s postures and gestures if in competition with them (see Figure 6.7).

One way to explore the power of imitation is to do some observation in everyday life. For example, in a meeting at work, it is possible to observe body dynamics: who around the table is already holding similar postures? Are they people who share the same views? If you introduce a new pose (such as clasping your hands on your head), do people take the same pose? To directly observe the unconscious nature of these effects, you might ask them if they were aware that they copied your pose. Most likely, they will say no. Your colleagues can probably tell you who got along with whom in the meeting but may not be able to articulate exactly how body language affected their perceptions.

**Social Grouping**

People also communicate relationship in the ways they orient themselves toward others during the ebb and flow of group interaction. From a young age, humans learn which groups are open to our approach and which are not by observing whether group members seem to “open up” space as we approach. Turning to acknowledge
It is not uncommon for members of a group to imitate the postures of their leader.

new arrivals, and including them in the sweep of one’s gaze shows acceptance. “Turning a cold shoulder” is likely to cause the new person to hesitate, and if the situation does not change, to move on to some other group (see Figure 6.8).

There are many online 3D social environments and games but few with as natural and inviting a use of body language as There. Figure 6.9 and Clip 6.2 show how There avatars glance toward the speaker who is taking the current turn and realign themselves as a group to allow newcomers to enter and exit. These subtle automated touches help to tip the balance toward friendly interaction among players. For an in-depth discussion of the design choices made in creating There, see Section 6.4 for the interview with Chuck Clanton.

6.2.2 Bodies Communicate Identity

Posture and movement also communicate who people are as social individuals—what they will be like to interact with and what to expect from them.

Each of the people in Figure 6.10 is sending social signals through posture and movement—clues about how they are feeling and about their general persona.
Which group seems more approachable?
6.2 THE PSYCHOLOGICAL PRINCIPLES

Posture and movement can reveal both momentary and more persistent social qualities of a person. For example, (b) and (c) show far more animation than (a), and (b) has a much more expansive gait than (a).

*FIGURE 6.9*

There avatars automatically adjust their posture toward one another as conversations take place. ©2005 There.com. All rights reserved.

*FIGURE 6.10*
FIGURE 6.10 (Cont'd)

b

c
Putting a name on the kinds of qualities one can observe in these examples, and understanding their underlying dimensions, has been an ongoing challenge for psychologists. Some nonverbal qualities easily map to broader traits, such as friendliness or dominance (which were discussed in Chapter 2). Others seem specific to movement itself. One researcher analyzed nonverbal style by systematically collecting words for movement qualities and asking people to rate friends’ movement styles using these words (Gallaher 1992). Based on the results, she came up with a few key factors:

• **Expressiveness.** Using a lot of variety and energy in expressions and gestures when talking with others.

• **Animation.** Showing a lot of energy in general movement—a bouncy walk, quick reactions, and so on.

• **Expansiveness.** Taking up more space with one’s body in movement.

• **Coordination.** Moving smoothly and with grace.

She found statistical connections between these movement qualities and personal qualities. For example, someone who was habitually fearful would typically show less expansive movement and less animation.

She also found a gender-related pattern: women tended to score higher on the expressiveness scale, while men scored higher on the expansiveness scale. And she found trends of connection between a person’s body type and their movement style: heavier people were rated as less animated and more expansive; taller people were rated as more expansive, and people with more muscle were rated as more animated and coordinated.

Gallaher’s findings mesh well with the movement analysis dimensions developed by a famous early-twentieth-century dance researcher, Rudolf Laban (Laban 1974). He created a system of movement analysis in which he coded the following dimensions:

• **Space.** Whether movement is indirect and wandering or to the point (shooing flies versus threading a needle).

• **Weight.** A light movement seems weightless and easy; a strong movement shows much force behind it (brushing your fingers across a flower’s petals versus wringing a towel).

• **Time.** Sustained actions seem to take their time; sudden actions are rapid and over quickly (petting a cat versus grabbing the cat as it is about to escape from the house).

• **Flow.** Free movement looks loose and uncontrolled; bound movement looks quite controlled and perhaps even rigid (a dog shaking water off itself versus balancing a biscuit on its nose).
Laban crafted a system of movement notation to diagram the qualities of any given action. In Figure 6.11a Laban’s parameters for movement are arranged in a notational space, and in Figure 6.11b, the effort diagram of someone screwing a lightbulb into place shows how the notation gets used for a particular motion.

There has been recent work examining the Laban signatures of emotionally-driven movement, clustering emotional movements into different effort signatures (Fagerberg, Ståhl, and Höök 2004). These researchers found some interesting clusters of emotions (see Figure 6.12):

- Excitement, anger, and surprised–afraid (all flexible, fluent, and quick motions)
- Sulkiness, surprised–interested, pride, satisfaction (all direct, light, bound, and sustained motions)
- Sadness, being in love (sustained, fluent, light, and direct motions)

A Laban effort graph of putting in a lightbulb (based on [Fagerberg, Ståhl, and Höök 2003]).
There is no definitive empirical strategy for analyzing motion as it expresses emotion, mood, or more enduring personality traits. However, working from Gallaher’s and Laban’s dimensions, it is possible to create a profile of a character’s style of movement that can be useful for a design team in guiding choices about animation details. Thinking about a character’s likely emotions in a social encounter, and about the character’s overall personality and build and how these will impact motion, will help take full advantage of the character’s body as a social instrument.

Designers of professional sports games invest considerable design time in recreating the signature moves and general style of athletes from real-world teams. Even games such as SSX™ 3 that do not explicitly recreate famous athletes, exaggerate the qualities that everyday people envy in athletes: their high level of coordination and the magical way they have of making difficult movements seem light, weightless, flowing, and with a sense that they have all the time in the world at their disposal (see Figure 6.13). Watching Clip 6.3 while keeping Laban’s dimensions of effort—space, weight, time, and flow—in mind, it becomes apparent that these characters lift the player out of the everyday by heightening these qualities.

In contrast, consider again the movements of the player-character and Yorda in ICO (see Figure 6.14 and Clip 6.1). Neither has nearly the coordination and
smooth grace of the athletes. The player-character uses rapid, sometimes clumsy
movements. Yorda is more flowing but also clumsy. Both characters create a
sense of vulnerability and dependence through their movements, heightening the
tension for the player and perhaps increasing the urge toward teamwork for
survival. By manipulating body movements, the designers have subtly pressured
the player’s game-play strategy and emotions.

Sports games such as SSX™ 3 showcase the signature moves and general grace of athletes.
SSX™ 3 image ©2005 Electronic Arts Inc. SSX is a registered trademark of Electronic Arts Inc. in
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ICO’s player-character and his companion, Yorda, move very differently than sports characters. ICO
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6.3 Design Pointers

6.3.1 Think between Characters
When coming up with initial character concepts and sketches, think not just about how each character behaves in isolation but also about the relationships between characters. How does this character feel about that one? How does he express this in how he moves? Does he keep a greater distance from the other? Are his movements more closed and tense around the other? It is possible to provide a much richer and more socially realistic experience for the player if designs are grounded within the larger social framework of the interactions between bodies.

6.3.2 Use Touch and Interpersonal Distance
Consider using touch and interpersonal distance to help players understand character relationships and to enhance emotional reactions to what is going on. If a player is being mentored by a character, why not have that character give the player’s character a friendly pat on the shoulder? If a player is closer to one character and not friendly with another, show this in how close they stand when they talk and how their bodies orient toward one another. You can even incorporate social touch into core game-play dynamics, as in ICO, expanding the notion of physical contact in games beyond trading blows.

6.3.3 Imitation: A Missed Opportunity
The principle of imitation was included in this chapter, although I could not find a good current game example, leading me to believe that this is a powerful, missed design opportunity. Consider how the subtle imitation of a powerful character’s movements by more submissive characters could enhance their apparent authority and charisma. Imagine showing shifting alliances in a complex RPG through imitation by characters. Envision showing friendship networks and hierarchies in a social online game through automated imitation by player-characters. Think creatively about making use of imitation.

6.3.4 Group Dynamics
The designers at There have demonstrated the value of incorporating group dynamics into 3D chat. When creating a multiplayer environment, consider building and extending from their work to help make the game more socially realistic and engaging.
6.3.5 Extend a Game’s Character-Style Palette

When planning how characters will move, consider the signature dimensions of body movement that were discussed earlier and choose a palette of physical qualities that evokes the experience you want the player to have. Not all characters should possess the exaggerated grace and flow of professional athletes. ICO is a splendid example of using some awkward movement traits to create a different sort of engaging player experience.

Consider taking time during the design phase to give each character a rating along Gallaher’s dimensions: expressiveness, animation, expansiveness, and coordination. When crafting specific animations, Laban’s effort dimensions—space, weight, time, and flow—may be useful for helping to capture the personality and mood of a character performing that motion.

6.4 Interview: Chuck Clanton

Chuck Clanton wore many hats during the creation of There, including director of user experience, principal designer, and executive producer of social interaction. Clanton was codesigner of this avatar-centric communication project (described in Section 6.2.1 under Social Grouping and discussed in this interview). Prior to joining the There team, Clanton was at Bullfrog and Electronic Arts U.K. Studio.

Chuck Clanton of There.
Q: First of all, a little about There itself: some folks might not consider this a game. What about you? Do you think that There falls within the “game” context? Why or why not? What is or are the primary driver(s) for participation in There for players?

Based on strict definitions, There is certainly not a game. It has a physics, which could be considered rules, but there is no way to win or lose. In the entertainment sense, it is a toy, something you use for play. Psychologically, it is an immersive environment, a world, and a place where you can live part of your life.

We thought and talked about There as being a virtual world, a place where games could be invented and played. Like the real world, much of the fun surrounds rather than inhabits games. You anticipate a game, you prepare to play or to watch your team, you talk about what happened afterward and are elated or depressed at the results, sharing those feelings with others. Like the real world, games result in social fun outside the game itself.

So, activities in There are certainly games. I ran one of the first Buffy Trivia Contests in There. It was great fun and definitely a game. One woman knew the answer to every question and was fast on the buzzer. The contest was so one-sided that we all got quite silly and giggly, spending more time talking and razzing each other than actually playing. I talked with contestants and even others who had heard about it for days afterward.

(The winner ended up running most of the Buffy Trivia Contests later because no one wanted to play against her!)

Most people are attracted to There because of the opportunity to do fun activities with other people, and they stay in There because they form friendships. Fun activities include those available in real life, like shopping for the right outfit, and those that are purely fantasies, like “surfing” the boneyard in Tyr under the full moon on a hoverboard. For some, their avatar is an extension of themselves so they are living in this virtual world.
For others, their avatar is a fantasy of some part of themselves they would like to experience and cannot in any other way. An example of this is selecting an avatar of the opposite gender. It is quite thought provoking as a guy to have a female avatar and see all the ways other guys relate to me. (And I enjoy all of the possibilities for clothing that are not available to male avatars. In Elizabethan times, men got to wear all sorts of fancy clothing, but today most finery is reserved for women. In the animal kingdom, adornment of the male is commonplace, often more than of the female. Too bad for modern men, but in a virtual world, you can choose to have a female avatar and take advantage of all of the wonderful clothing that exists in There.)

Q: There seems to be primarily a social activity space. Did this focus of play affect how you developed player-character styling, animation, and actions? How so?

Yes, very much so. Very early in the development of There, we initiated a project called “avatar-centric communication.” The team working on this was Jeffrey Ventrella, who codesigned most of this with me; Fernando Paiz, who was our lead engineer and a very creative contributor; and Ko Patel, another very creative engineer who contributed many ideas as well. Tom Melcher, the president at that time, was really our executive producer and a creative contributor as well. We believed very strongly that There would be primarily a social place. So talking with others would be extraordinarily important. In real life, talking in person has great value compared to a disembodied voice, like the telephone, or even this email conversation. We knew we needed to express that value in There to realize the benefit of having an avatar. Otherwise, you might as well use email and IM. There are several reasons why having a conversation in a body in a place is important. The place itself adds context. Talking while looking out at an incredible vista from the top of a volcano is very different from meeting someone in a small dark tomb whose hidden entrance you just discovered. A crowded bar adds a different flavor than the seashore. The greatest value comes from the body of your avatars, body language.

Body language appears in two ways... autonomic and intentional. The autonomic nervous system is what keeps you alive, it runs your heartbeat and breathing. Avatars breath and move around slightly all of the time, just like humans. This makes them seem alive. Intentional expressions are driven by the intentions of the user. You can use the smiley language to smile or laugh or cry. In addition, if you use certain words like “yes” and “no” in your chat balloons, your avatar nods or shakes its head. In fact, we keep track of the emotional state of the body language you use and the level of attention based on how much you are chatting, and change the poses of the avatar continuously to make the ongoing body language of your avatar consistent with the conversation. And finally, there are many elements to body language that create social context. For example, when someone joins a conversation group, everyone looks at them briefly. This makes you feel acknowledged and welcome but is much too small a behavior to require that the user control it. So our avatars do these nearly subconscious social acts as part of their autonomic behavior, and it makes conversations feel much more natural.
The styling of the avatars went through several iterations. Our first avatars were very simple and cartoonlike and incredibly expressive. Cartoon faces can do things that real faces cannot. But they were so cartoonlike that it was hard to “inhabit” the avatar as yourself. We then made avatars that were much more realistic. This caused expressivity of the faces to suffer. So the final version you see today is somewhat less realistic and more expressive.

And just as the avatars are somewhat less realistic in order to be more expressive, we also added emotional expressions that are familiar but not realistic . . . what we call moodicons. I can send a big red heart from my chest to yours with the smiley language or cause yellow question marks to rise out of my head. We are all familiar with this language from cartoons, and it has a lot of emotional power that mere expressions do not.

Q: I notice that the There avatars move on their own during chat. Why is this? What did you have in mind when designing these animations? Have you done any play testing of player reactions to this low-level autonomy of their avatars? If so, how did they feel?

I did dozens of play tests as we progressed through the avatar-centric communication project. Of course, we tried many variants and found many dead ends as well as fortuitous discoveries. Social autonomic behaviors have a very significant impact on improving the sense of presence and welcome and involvement in the group. For example, if others look at you when you speak, you feel their presence and you are more likely to talk and feel involved.

Another element that bears mentioning is the camera. In most virtual worlds, there is a single, fixed third-person camera that trails your avatar and creates the experience of having a body in the world. However, in films, the camera is used much more expressively. Studies on the psychology of TV and film show that the bigger an image is on your retina, the greater its emotional impact. That’s why the close-up shot in film is used to create emotionally powerful scenes. In There, we wanted social interactions to have similar power. So we created a cinematic camera for conversational groups. When someone uses a strong emotional expression like laughing, the camera cuts to their face briefly to give power to that expression. Play testing did prove that this was very powerful, but it could also be annoying. In large conversational groups, the camera cuts felt distracting, and we also noticed that most members used fewer emotions and focused more on chat in that setting. So, over time, we carefully tuned the context where camera cuts would be used.

We also gave users control over the camera so they could accept the default view on joining a conversational group, which shows everyone but is quite distant, or they could rotate and zoom the camera in to better see what they are interested in. So, for example, when seated in the audience at a stage, you can choose to have a close-up camera view of the people on the stage or of the audience or of yourself and your nearest neighbors. In some games, audience members may need to talk among themselves, which is best done with one camera, and then call out answers to someone on a stage, which is best viewed with a different camera.

The camera is one of the most powerful tools in There for creating social spaces and increasing the expressive power of body language.
Q: How did the design process unfold? Any anecdotes you are willing to share with readers about choices you made in developing the player-characters for There (body language or any other factors)?

The avatar-centric communication project went through three major phases that reveal the power of iterative design. We created an initial prototype for two avatars where conversations could occur any time the two approached one another face to face. Most of the social and body language features were invented in this phase. Our intelligent cinematic camera worked very well, and we were all sold by this prototype on the success of our approach. Then we added more avatars, and the camera could not be made to work. It is a very hard problem finding good camera angles to view everyone in a conversation when they are allowed to stand in arbitrary positions relative to one another in the world, and without a good camera, most of the emotional power disappears. We needed avatars to be in specific positions to engage in conversation. We invented the chatprop, and our first chatprop was the loveseat. The loveseat was a two-person bench where we imagined a couple sitting, talking, flirting, arguing... and we made the camera change its position as the avatars changed their poses. If you sat facing your partner, the camera shot would emphasize togetherness. If you turned away, it would emphasize separation. This chatprop was great, but unfortunately it was a dead end. In almost every other chatprop, emotional expression of pose and camera view needed to be separately controlled. Another iteration in our design lead to many chatprops, like a living room with a sofa and two chairs, a stage with audience seats, where camera view is directly controlled. All during this phase, conversational groups could only form when seated, never when standing around in the world because we did not know how to solve the camera problem with free-form groups. We knew what we wanted, but it was very difficult to program. We wanted avatars to be nudged into fixed positions relative to one another when they started talking. And we finally figured out how to do it. So, today if you walk up and talk to another avatar, you are both nudged into a specific position relative to one another, and the camera works correctly to show the conversation and cut to your facial expressions. Others can come up and join the conversation, and everyone moves sideways slightly to let them in.

We began with a simple prototype that allowed conversations in the world to work well, it didn't scale, we had to solve many problems along the way, and finally we came full circle to solving our original problem. Of course, there were many design areas like this. For example, chat balloons rise from each avatar and their order tells you about the conversational order. If they rise too fast, it is impossible to follow the conversation. So we designed a fairly complex scheme to make conversations as legible as possible by keeping the chat balloon ascent as slow as possible during heavy chat.

Q: Do you think your players are conscious of all the body language you've put into the avatars?

I know they are not conscious of it from play-testing results, but it has its intended effect without calling attention to itself.
6.5 Summary and What Is Next

This chapter discussed some of the social cues bodies convey about a person’s relationships and identity, using examples from games that make use of these principles. Design suggestions were made for incorporating body cues into character designs, including the missed opportunity of imitation. Chapter 7 will complete this section on using characters’ social equipment with a discussion of the power of the voice.

6.6 Exercise: Social Bodies

Watch a movie together, with the sound turned off. Look for the social uses of the body that were discussed in this chapter: interpersonal distance, touch, identity, social grouping, and attitude. As you watch, pause and rewind the movie whenever necessary to get a better look at particular examples. Have one person jot down notes about where and how body dynamics are being used in the film that you can use later as reference. Working in teams, design and begin to animate a party of characters for an RPG that use some of the behaviors you saw, focusing on how the space and actions between characters work.

6.7 Further Reading


