CHAPTER TEN

The Experience Is in the *Player's Mind*

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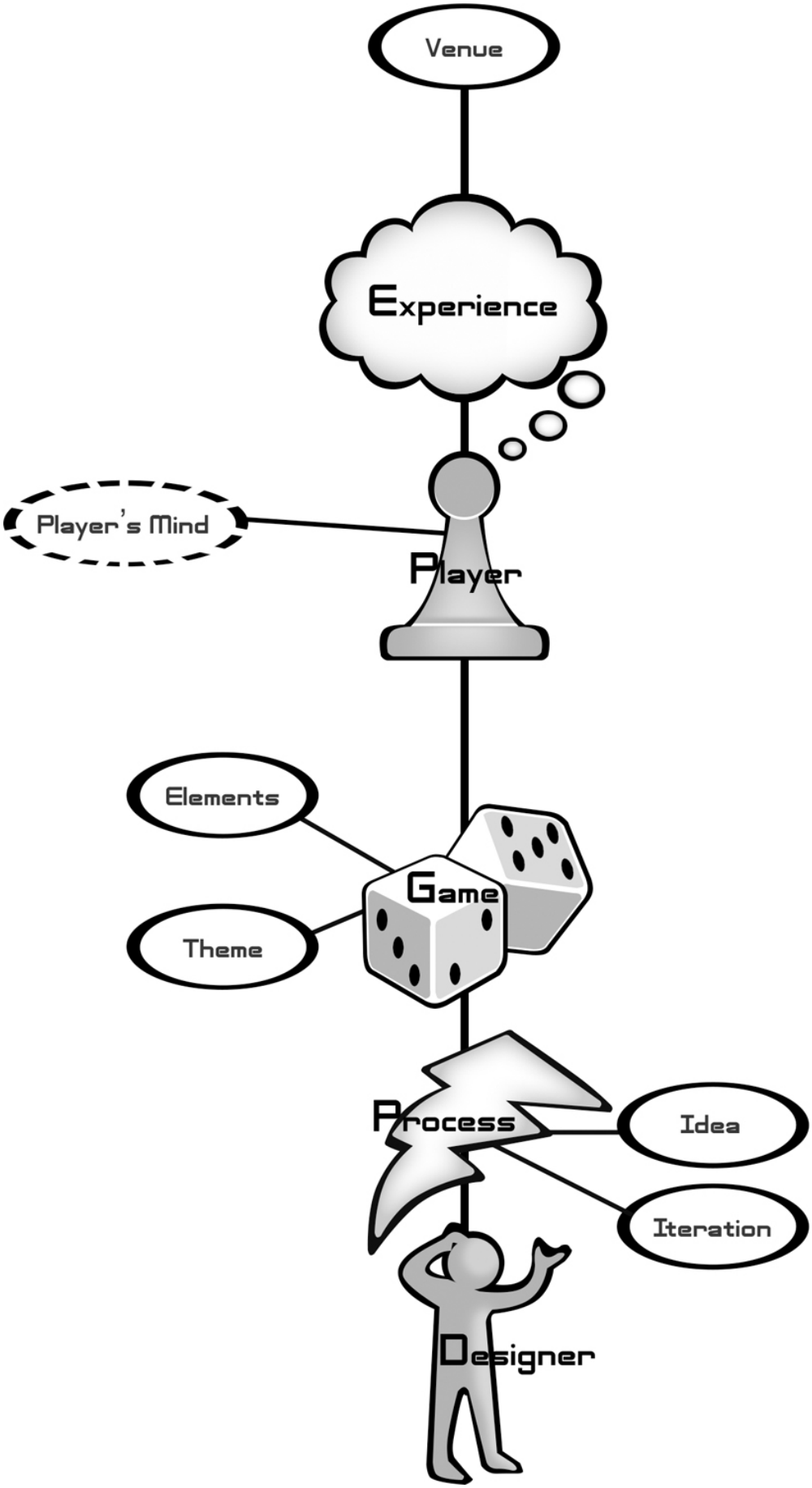
FIGURE
10.1



We have already discussed that ultimately, experiences are what a game designer creates. These experiences can only happen in one place—the human brain. Entertaining the human brain is hard because

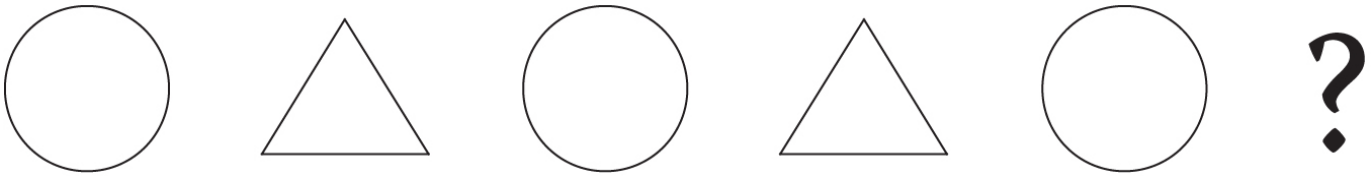
it is so complex—it is the most complex object in the known universe.

Even worse, most of its workings are hidden from us.

Until you got to this sentence, were you at all conscious of the position of your feet, the rate of your breathing, or how your eyes were moving across the page? Do you even know how your eyes move across the page? Do they move smoothly and linearly, or do they take little hops? How could you have read books for so many years without being sure of the answer to that question? When you speak, do you really know what you are going to say before you say it? Incredibly, when you drive a car, somehow you observe the curvature of the roadway and translate that into a rotational angle by which you move the steering wheel. Who does that calculation? Can you even remember paying attention to the curvature of the roadway? And how does it happen that just because this sentence contains the words "imagine eating a hamburger with pickles," your mouth is watering right now?

Consider this pattern:

FIGURE
10.2



Somehow, you know what comes next. How did you reach that conclusion? Was it through a process of deductive logic, or did you just "see" the answer? If you just saw it, what did you see? And who drew the picture that you saw?

Here's one more. Try this experiment: find a friend, and ask them to do these three things:

1. Say the word "boast" five times. "Boast, boast, boast, boast, boast."
2. Spell the word "boast" out loud. "B-O-A-S-T."
3. Answer this question: "What do you put in a toaster?"

Your friend will likely give the answer "toast." Generally, toast is what you take out of a toaster, not what you put in. If you omit the first two steps, most people will give a more correct answer, like "bread." Priming the brain's networks with "boast" is enough to make the word "toast" seem like a better candidate than the correct answer, "bread." We normally think of answering a question like "What do you put in a toaster?" as a very conscious event, but the truth is that the subconscious exerts terrific control over almost everything we say and do. Mostly it does that wisely and well, and we feel like "we" are doing it—but from time to time, it makes a laughable mistake and reveals how much control it truly has.

The majority of what is going on in our brains is hidden from the conscious mind. Psychologists are gradually making progress toward understanding these subconscious processes, but generally, we are in the dark as to how they really work. The workings of our mind are mostly outside our understanding and mostly outside our control. But the mind is the place that game experiences happen, so we must do what we can to get a working knowledge of what seems to be going on in there. In Chapter 7: *Idea*, we talked about using the power of the creative subconscious to be a better designer. Now we must consider the interaction of the conscious and subconscious in the mind of the player. Everything that is known about the human mind would fill many encyclopedias—we will contain our examination of the mind to some of the key factors that relate to game design.

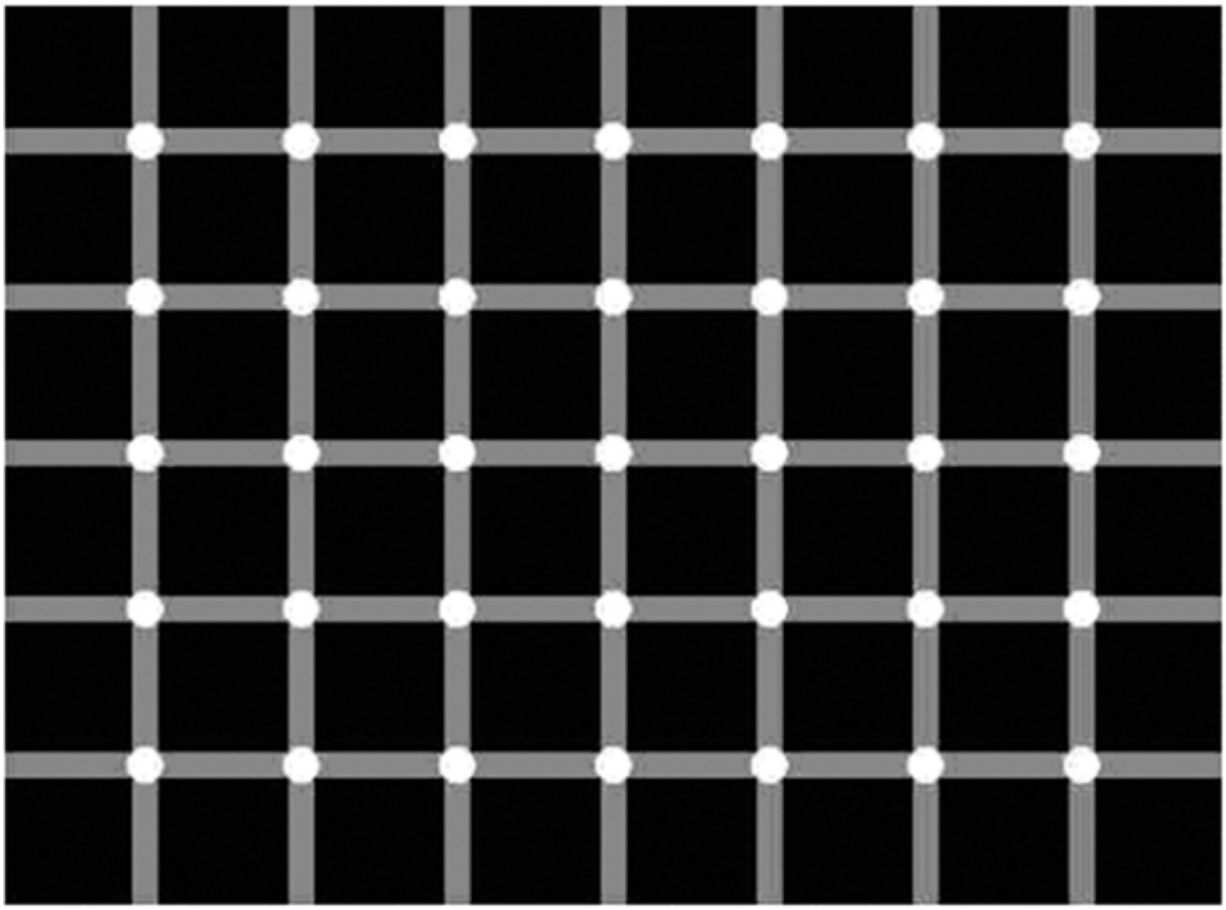
There are four principal mental abilities that make gameplay possible. These are modeling, focus, imagination, and empathy. We will consider each in turn and then examine the secret priorities of every player's subconscious mind.

Modeling

Reality is amazingly complex. The only way our minds are able to get by at all is by simplifying reality so that we can make some sense of it. Correspondingly, our minds do not deal with reality itself, but instead

with models of reality. Mostly we do not notice this—the modeling takes place below our awareness. Consciousness is an illusion that our internal experiences are reality, when in truth they are imperfect simulations of something we may never truly understand. The illusion is a very good one, but at times we run into places where our internal simulations fail. Some of these are visual, like this picture:

FIGURE
10.3



In reality, those dots are not changing color as our eyes move around, but our brain sure does make it look like they are.

Some examples don't become clear until you think about them a little bit, such as the visible light spectrum. From a physics point of view, visible light, infrared, ultraviolet, and microwaves are all the same kind of electromagnetic radiation, just at different wavelengths. Our eyes can only see a tiny fraction of this smooth spectrum, and we call this fraction "visible light." It would be very useful if we could see other kinds of light. Seeing infrared light, for example, would let us easily spot predators in the dark, since all living things emit infrared light. Unfortunately, the insides of our eyeballs emit infrared as well, so if we could see it, we would be quickly blinded by our own glow. As a result, a huge amount of useful data, that is, everything outside the visible light range of the electromagnetic spectrum, is not part of our perceived reality.

Even the visible light we can see is strangely filtered by our eyes and brains. Because of the construction of our eye, this spread of visible light wavelengths looks like it falls into distinct groupings, which we call colors. When we look at a rainbow that comes out of a prism, we can draw lines to separate one color from another. In truth, though, this is just an artifact of the mechanics of the retina. In reality, there is no sharp separation of colors, just a smooth gradient of wavelengths, even though our eyes tell us that blue and light blue are much more similar than, say, light blue and green. We evolved this eye structure because breaking up the wavelengths into groups like this is a useful way to better understand the world. "Colors" are only an illusion, not part of reality at all, but a very useful model of reality.

Reality is full of aspects that aren't at all part of our day-to-day modeling. For example, our bodies, our homes, and our food are teeming with microscopic bacteria and mites. Many are single celled, but others,

such as the demodex folliculorum that lives in our eyelashes, pores, and hair follicles, are almost large enough (up to 0.4mm) to be seen with the naked eye. These tiny creatures are everywhere around us, but are generally not part of our mental models at all, because mostly, we don't need or want to know about them.

FIGURE
10.4

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One good way to get a grasp on some of our mental models is to look for things that feel natural to us until we think about them. Consider this picture of Charlie Brown. At first glance, nothing seems too unusual about him—he's just a boy. But upon reflection, he looks nothing like a real person. His head is nearly as big as his body! His fingers are little bumps! Most distressing of all, he is made of lines. Look around you—nothing is made of lines—everything is made of lumps. His unreality doesn't become apparent until we stop and consciously think about it, and this is a clue to how the brain models things.

Charlie Brown seems like a person even though he doesn't look like anyone we know because he matches some of our internal models. We accept his giant head because our minds store much more information about heads and faces than the rest of the body, since so much information about a person's feelings comes from their face. If instead he had a small head and giant feet, he would immediately look ridiculous, because he wouldn't match our internal models at all.

And what about his lines? It is a challenging problem for the brain to look at a scene and pick out which objects are separate from each other. When it does, below our conscious level, our internal visual processing system draws lines around each separate object. Our conscious mind never sees these lines, but

it does get a feeling about which things in a scene are separate objects. When we are presented with a picture already drawn with lines, it has been "predigested" in a sense, matching our internal modeling mechanisms perfectly and saving them a lot of work. This is part of why people find cartoons and comics so soothing to look at—our brain needs to do less work to understand them.

Stage magicians amaze us by taking advantage of our mental models and then breaking them. In our mind, our models are reality, so we feel like we are seeing someone do the impossible. The audible gasp that comes from an audience at the culmination of a magic trick is the sound of their mental models being torn asunder. It is only through our faith that "it must be a trick" that we are able to reason that magicians don't have supernatural powers.

Our brains do a tremendous amount of work to boil down the complexity of reality into simpler mental models that can be easily stored, considered, and manipulated. And this is not just the case for visual objects. It is also the case for human relationships, risk and reward evaluation, and decision making. Our minds look at a complex situation and try to boil it down to a simple set of rules and relationships that we can manipulate internally.

As game designers, we care a lot about these mental models because games, with their simple rules, are like Charlie Brown—they are predigested models that we can easily absorb and manipulate. This is why they are relaxing to play—they are less work for our brain than the real world, because so much of the complexity has been stripped away. Abstract strategy games, like tic-tac-toe and backgammon, are almost completely bare models. Other games, like computer-based RPGs, take a simple model and coat it with some sugary aesthetics, so that the very act of working to digest the model is pleasurable. This is so different from the real world, where you have to work so hard to figure out what the rules of the game even are and then work even harder to properly play by them, never sure if you are doing the right thing. And this is why games can sometimes be great practice for the real world—it is why they still teach chess at West Point—games give us practice digesting and experimenting with simpler models, so we can work our way up to ones as complex as the real world and be competent at dealing with them when we are ready.

The important thing to understand is that everything we experience and think about is a model—not reality. Reality is beyond our understanding and comprehension. All we can understand is our little model of reality. Sometimes this model breaks, and we have to fix it. The reality we experience is just an illusion, but this illusion is the only reality we will ever know. As a designer, if you can understand and control how that illusion is formed in your player's mind, you will create experiences that feel as real, or more real, than reality itself.

Focus

> *Time sometimes flies like a bird, sometimes crawls like a snail; but a man is happiest when he does not even notice whether it passes swiftly or slowly.*
>
> —Ivan Turgenev

One crucial technique our brains use to make sense of the world is the ability to focus its attention selectively, ignoring some things and devoting more mental power to others. The brain's ability to do this can be startling. One example is the "cocktail party effect," which is our remarkable ability to pay attention to a single conversation when a roomful of people are all talking at once. Even though the sound waves from many conversations are hitting our ears simultaneously, we somehow have the ability to "tune in" one and "tune out" the others. To study this, psychologists have performed what are sometimes called "dichotic ear-studies." In these experiments, subjects wear headphones that deliver different audio experiences to each ear. For example, a voice in a subject's left ear might be reading Shakespeare, and the voice in a subject's right ear might be reading a stream of numbers. Provided the voices are not too similar, subjects who are asked to focus on one of the voices and repeat back what they are hearing as they hear it are generally able to do so. Afterward, when asked questions about what the other voice was saying, subjects generally have no idea. Their brains focused only on selected information and tuned out the rest.

What we focus on at any given moment is determined through a blend of our unconscious desires and

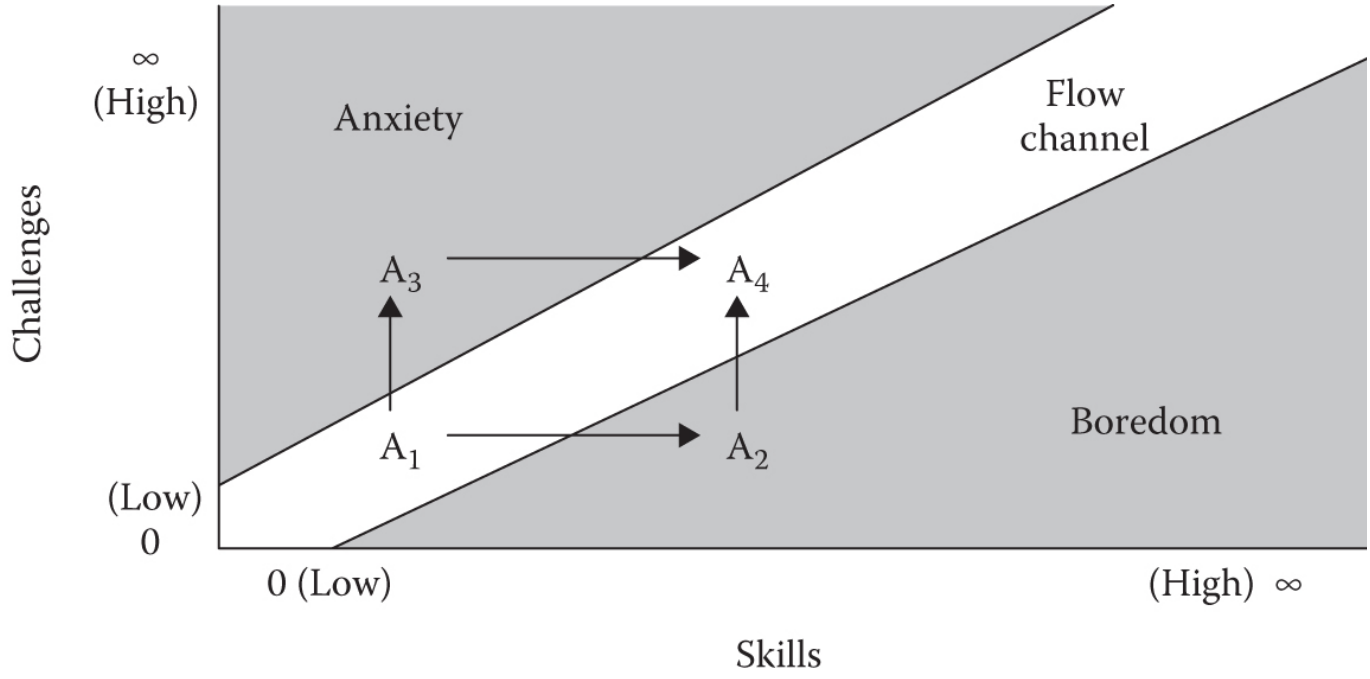
our conscious will. When we create games, our goal is to create an experience interesting enough that it holds the player's focus as long and as intensely as possible. When something captures our complete attention and imagination for a long period, we enter an interesting mental state. The rest of the world seems to fall away, and we have no intrusive thoughts. All we are thinking about is what we are doing, and we completely lose track of time. This state of sustained focus, pleasure, and enjoyment is referred to as "flow" and has been the subject of extensive study by psychologist Mihaly Csikszentmihalyi and many others. Flow is sometimes defined as "a feeling of complete and energized focus in an activity, with a high level of enjoyment and fulfillment." It pays for game designers to make a careful study of flow, because this is exactly the feeling we want the players of our games to enjoy. The following are some of the key components necessary to create an activity that puts a player into a flow state:

- **Clear goals**: When our goals are clear, we are able to more easily stay focused on our task. When goals are unclear, we are not "into" our task, for we aren't at all certain whether our current actions are useful.
- **No distractions**: Distractions steal focus from our task. No focus, no flow. This means engaging both mind and hands. Menial labor with no thought makes the mind wander; just sitting and thinking can make the hands fidget. These "itchy" feelings are each a kind of distraction.
- **Direct feedback**: If every time we take an action, we have to wait before we know what effect the action caused, we will quickly become distracted and lose focus on our task. When feedback is immediate, we can easily stay focused. We'll talk much more about feedback in Chapter 15: *Interface*.
- **Continuously challenging**: Human beings love a challenge. But it must be a challenge we think we can achieve. If we start to think we can't achieve it, we feel frustrated, and our minds start seeking an activity more likely to be rewarding. On the other hand, if the challenge is too easy, we feel bored, and again, our minds start seeking more rewarding activities. Chapter 13: *Balance*, will have more to say about challenge.

Flow activities must manage to stay in the narrow margin of challenge that lies between boredom and frustration, for both of these unpleasant extremes cause our mind to change its focus to a new activity. Csikszentmihalyi calls this margin the "flow channel." He gives an example of the flow channel, using, not surprisingly, a game:

> *Let us assume that the figure below represents a specific activity—for example, the game of tennis. The two theoretically most important dimensions of the experience, challenges and skills, are represented on the two axes of the diagram. The letter A represents Alex, a boy who is learning to play tennis. The diagram shows Alex at four different points in time. When he first starts playing (A_1), Alex has practically no skills, and the only challenge he faces is hitting the ball over the net. This is not a very difficult feat, but Alex is likely to enjoy it because the difficulty is just right for his rudimentary skills. So at this point he will probably be in flow. But he cannot stay there long. After a while, if he keeps practicing, his skills are bound to improve, and then he will grow bored just batting the ball over the net (A_2). Or it might happen that he meets a more practiced opponent, in which case he will realize that there are much harder challenges for him than just lobbing the ball—at that point, he will feel some anxiety (A_3) concerning his poor performance.*

FIGURE
10.5



Neither boredom nor anxiety are positive experiences, so Alex will be motivated to return to the flow state. How is he to do it? Glancing again at the diagram, we see that if he is bored (A_2) and wishes to be in flow again, Alex has essentially only one choice: to increase the challenges he is facing. (He also has a second choice, which is to give up tennis altogether—in which case A would simply disappear from the diagram.) By setting himself a new and more difficult goal that matches his skills—for instance, to beat an opponent just a little more advanced that he is—Alex would be back in flow (A_4).

If Alex is anxious (A_3), the way back to flow requires that he increase his skills. Theoretically he could also reduce the challenges he is facing, and thus return to the flow where he started (in A_1), but in practice it is difficult to ignore challenges once one is aware that they exist.

The diagram shows that both A_1 and A_4 represent situations in which Alex is in flow. Although both are equally enjoyable, the two states are quite different in that A_4 is a more complex experience than A_1. It is more complex because it involves greater challenges, and demands greater skill from the player.

But A_4, although complex and enjoyable, does not represent a stable situation either. As Alex keeps playing, either he will become bored by the stale opportunities he finds at that level, or he will become anxious and frustrated by his relatively low ability. So the motivation to enjoy himself again will push him to get back into the flow channel, but now at a level of complexity even higher than A_4.

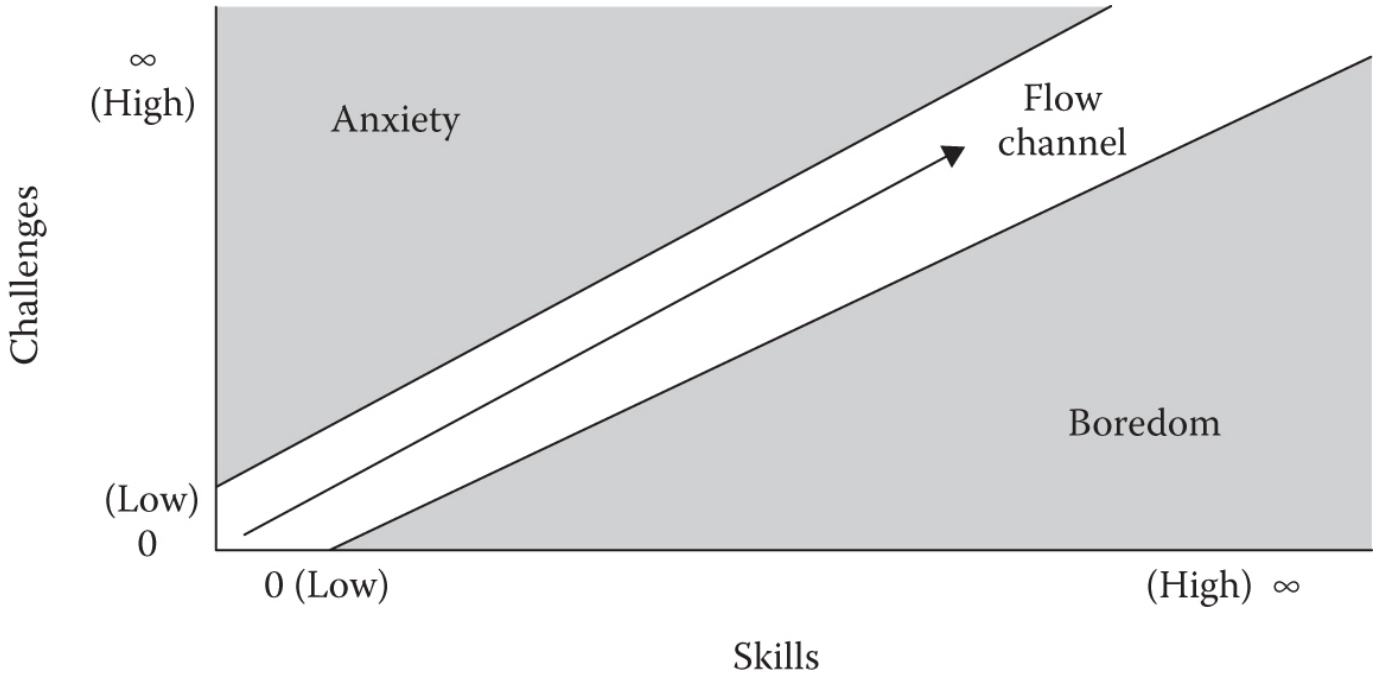
It is this dynamic feature that explains why flow activities lead to growth and discovery. One cannot enjoy doing the same thing at the same level for long. We grow either bored or frustrated, and then the desire to enjoy ourselves again pushes us to stretch our skills, or to discover new opportunities for using them.

You can see how keeping someone in the flow channel is a delicate balance, for a player's skill level seldom stays in one place. As their skill increases, you must present them with commensurate challenges. For traditional games, this challenge primarily comes from seeking out more challenging opponents. In videogames, there is often a sequence of levels that gradually get more challenging. This pattern of levels of increasing difficulty is nicely self-balancing—players with a lot of skill can usually move through the lower levels quickly, until they come to the levels that challenge them. This connection between skill and the speed of finishing a level helps keep skilled players from getting bored. However, it is the rare player who is persistent enough to win the game, mastering all levels. Most players eventually reach a level where

they spend so much time in the frustration zone that they give up on the game. There is much debate about whether that is a bad thing (many players are frustrated) or a good thing (since only skilled, persistent players can reach the end, the accomplishment is special).

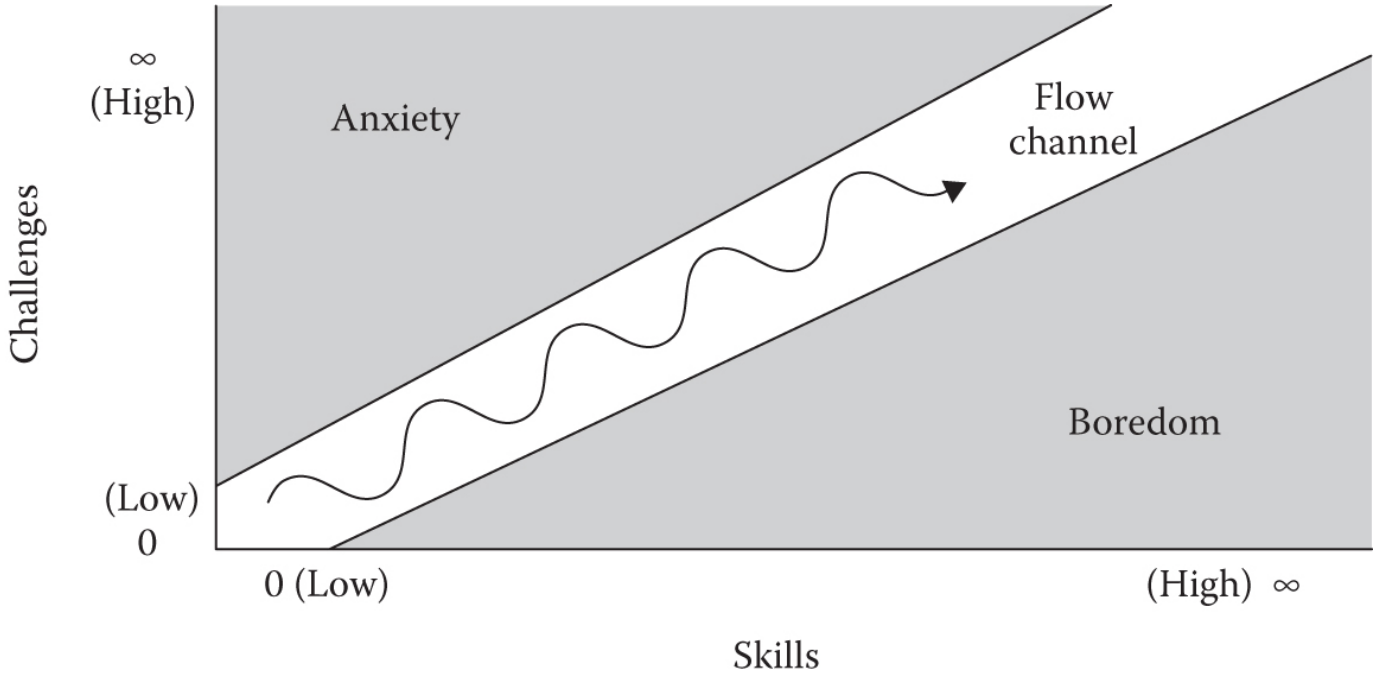
Many designers are quick to point out that while staying in the flow channel is important, some ways of moving up the channel are better than others. Moving straight up the channel like this…

FIGURE
10.6



…is definitely better than the game ending in anxiety or boredom. But consider the play experience that follows a track more like this:

FIGURE
10.7



This will probably feel much more interesting to a player. It is a repeating cycle of increasing challenge,

followed by a reward, often of more power, which gives an easier period of less challenge. Soon enough, the challenge ramps up again. For example, a videogame might feature a gun that lets me destroy enemies if I shoot them three times. As I proceed through the game, the enemies grow more numerous, increasing the challenge. If I rise to the challenge, though, and defeat enough enemies, I might be rewarded with a gun that lets me destroy the enemies with only two shots. Suddenly the game is easier, which is very rewarding. This easy period doesn't last though, because soon new enemies that take three and even four shots to destroy, even with my new gun, will start to appear, taking the challenge to new heights.

This cycle of "tense and release, tense and release" comes up again and again in design. It seems to be inherent to human enjoyment. Too much tension, and we wear out. Too much relaxation, and we grow bored. When we fluctuate between the two, we enjoy both excitement and relaxation, and this oscillation also provides both the pleasure of variety and the pleasure of anticipation.

You can see how useful the idea of flow and the flow channel can be for discussing and analyzing a gameplay experience—so useful that it is Lens #21.

#21 The Lens of Flow

To use this lens, consider what is holding your player's focus.

Ask yourself these questions:

- Does my game have clear goals? If not, how can I fix that?
- Are the goals of the player the same goals I intended?
- Are there parts of the game that distract players to the point they forget their goal? If so, can these distractions be reduced or tied into the game goals?
- Does my game provide a steady stream of not-too-easy, not-too-hard challenges, taking into account the fact that the player's skills may be gradually improving?
- Are the player's skills improving at the rate I had hoped? If not, how can I change that?

Illustration by Diana Patton

Flow is a very hard thing to test for. You won't see it in ten minutes of gameplay. You must observe players for longer periods. Even trickier, a game that keeps someone in flow the first few times they play it may later become boring or frustrating.

When observing a player, flow can be easy to miss—you must learn to recognize it. It is not always accompanied by external expressions of emotion—it often involves quiet withdrawal. Players in flow playing solo games will often be quiet, possibly muttering to themselves. They are so focused that they are sometimes slow to respond or irritated if you ask them questions. Players in flow during multiplayer games will sometimes communicate with one another enthusiastically, constantly focused on the game. Once you notice a player going into flow during your game, you need to watch them closely—they won't stay there forever. You must watch for that crucial moment—the event that moves them out of the flow channel, so you can figure out how to make sure that event doesn't happen in your next prototype of the game.

One final note: don't forget to turn the Lens of Flow on yourself! You will surely find that times of flow are when you get the most done as a designer—make sure to organize your design time so you can get to that special state of mind as frequently as possible.

Empathy

As human beings, we have an amazing ability to project ourselves into the place of others. When we do this, we think the other person's thoughts and feel their feelings, to the best of our ability. It is one of the hallmarks of our ability to understand one another that we can do this, and it is an integral part of gameplay.

There is an interesting theater exercise where a group of actors is divided into two groups. In the first group, each actor chooses an emotion (happiness, sadness, anger, etc.), and then they all mill about the

stage, each trying to project their chosen emotion through attitude, walk, and facial expression. The second group does not choose an emotion. They just walk about at random among the first group, trying to establish eye contact with others. The first time they try this, the actors in the second group discover themselves doing something shocking—whenever they make eye contact with someone projecting an emotion, they take on the emotion themselves and make the corresponding facial expression, without consciously willing to do so.

This is how strong our power of empathy can be. Without even trying, we become other people. When we see someone who is happy, we can feel their joy as if it is our own. When we see someone who is sad, we can feel their pain. Entertainers use our power of empathy to make us feel we are part of the story world they are creating. Amazingly, our empathy can be cast from one person to another in the blink of an eye. We can even empathize with animals.

Have you noticed that dogs have much richer facial expression than other animals? They express emotion with their eyes and eyebrows much like we do (Figure 10.8). Wolves (dog ancestors) don't have nearly the range of facial expression of domesticated dogs. Dogs appear to have evolved this ability as a survival skill. Dogs that could make the right faces could capture our empathy, and we, suddenly feeling their feelings, became more likely to take care of them.

Of course, the brain does all this using mental models—in truth, we are empathizing not with real people or animals, but with our mental models of them—which means we are easily tricked. We can feel emotion when there is none. A photo, a drawing, or a videogame character can just as easily capture our empathy. Cinematographers understand this, and they fling our empathy all over the place, from one character to another, thus manipulating our feelings and emotions. Next time you watch television, pay attention, moment to moment, about where your empathy is going and why it is going there.

FIGURE
10.8

As game designers, we will make use of empathy in the same ways that novelists, graphic artists, and filmmakers do, but we also have our own set of new empathic interactions. Games are about problem solving, and empathic projection is a useful method of problem solving. If I can imagine myself in the place of another, I can make better decisions about what that person can do to solve a particular problem. Also, in games, you don't just project your feelings into a character, you project your entire decision-making capacity into that character and can become them in a way that isn't possible in non-interactive media. We will discuss the implications of this in detail in Chapter 20: *Characters*.

Imagination

The most beautiful world is always entered through imagination.

—Hellen Keller

Imagination puts the player into the game by putting the game into the player.

FIGURE
10.9

You might think, when I talk about the power of the player's imagination, that I might mean their creative imagination and the power to make up dreamlike fantasy worlds—but I am talking about something much more mundane. The imagination I'm talking about is the miraculous power that everyone takes for granted—the everyday imagination that every person uses for communication and problem solving. For example, if I tell you a short story, "The mailman stole my car yesterday," I have actually told you very little but already you have a picture of what happened. Weirdly, your picture is full of details that I didn't include in my story. Take a look at the mental image that formed, and answer these questions:

- What did the mailman look like?
- What kind of neighborhood was my car in when he stole it?
- What color was the car?
- What time of day did he steal it?
- How did he steal it?
- Why did he steal it?

Now, I didn't tell you any of those things, but your amazing imagination just made up a bunch of these details so that you could more easily think about what I was telling you. Now, if I suddenly give you more information, like "It wasn't a real car, but an expensive model toy car," you quickly reformulate your

imaginary image to fit what you have heard, and your answers to the preceding questions might change correspondingly. This ability to automatically fill in gaps is very relevant for game design, for it means that our games don't need to give every detail and players will be able to fill in the rest. The art comes in knowing what you should show the player and what you should leave to their imagination.

This power, when you think about it, is quite incredible. The fact that our brains only deal in simplified models of reality means that we can manipulate these models effortlessly, sometimes into situations that wouldn't be possible in reality. I can see an armchair and imagine what it would look like if it were a different color or a different size, if it was made of oatmeal, or if it was walking around. We do a lot of problem solving this way. If I ask you to find a way to change a light bulb without a stepladder, you immediately start imagining possible solutions.

Imagination has two crucial functions: the first is communication (often for storytelling) and the second is problem solving. Since games prominently feature both of these, game designers must understand how to engage the player's imagination as a storytelling partner, as well as having a sense of the problems it will and will not be able to solve.

The human mind is truly the most fascinating, amazing, complex thing that we know. We may never unravel all of its mysteries. The more we know about it, the better a chance we'll have of creating a great experience in it, for it is the site where all our game experiences take place. And never forget! You are equipped with one yourself. You can use your own powers of modeling, focus, empathy, and imagination to get to know how these powers are being used in the mind of your player. In this way, self-listening can be the key to listening to your audience. In the next chapter, we'll do some of that self-listening to understand why the brain is motivated to use any of these powers at all.

Other Reading to Consider

Flow: The Psychology of Optimal Experience **by Mihaly Csikszentmihalyi**. A highly readable exploration of the nature of flow written by its most prominent researcher.

CHAPTER ELEVEN

The Player's Mind Is Driven by the *Player's Motivation*

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FIGURE
11.1