Chapter 3
Working with Formal Elements

Exercise 3.1: Gin Rummy

Let's take the classic card game gin rummy. (If you don't know the game, you can look up the rules online.) There are two basic procedures to a turn in gin rummy: drawing and discarding. Take away the discard procedure and try to play the game. What happens?

Now take away both the discard procedure and the draw procedure, and then play the game. What's missing from the game?

Put the drawing and discarding procedures back, but take out the rule that says that an opponent can "lay off" unmatched cards to extend the knocker's sets. Is the game still playable with this change?

Now put back the original rules, but take away the objective and play the game again. What happens this time?

What does this exercise tell us about the formal elements of games?

Formal elements, as we've said, are those elements that form the structure of a game. Without them, games cease to be games. As you saw in the opening exercise of this chapter, a game without an objective, without rules or procedures, is not a game at all. Players, objective, procedures, rules, resources, conflict, boundaries, and outcome: These are the essence of games, and a strong understanding of their potential interrelationships is the foundation of game design.

After you grasp these basic principles, you can use the knowledge to create innovative combinations and new types of gameplay for your own games. This chapter will delve more deeply into each of the formal elements discussed in Chapter 2 and break them down into conceptual tools that you can use to analyze existing games or help make design decisions in your own games.

Players

We've said that games are experiences designed for players and that players must voluntarily accept the rules and constraints of the game in order to play. When players have accepted the invitation to play, they are within Huizinga's "magic circle," as discussed in Chapter 2. Within the magic circle, the rules of games take on a certain power and a certain potential. Bound by the rules of play, we perform actions that we would never otherwise consider—shooting, killing, and betrayal are some. But we also perform actions we would like to think ourselves capable of and have never had the chance to face—courage in the face of untenable odds, sacrifice, and difficult decision making. Somehow, through a strange and wonderful paradox, those restrictive and binding statements that are game rules, when put into motion within the safety of the magic circle, mysteriously create the opportunity for play.

Invitation to Play

Other arts also create their own temporary worlds: the frame of a painting, the proscenium of a stage, a motion picture screen. The moments of entry into these worlds are ritualized in recognizable moments: the dimming of the lights, the drawing back of the curtains, and, for games, the invitation to play. One of the most important moments in a game is this invitation. In a board or card game, the invitation is part of the social makeup of the game—players invite each other to play. The offer is accepted and the game is begun. In a digital game, the process is much more technical. Usually there is a start button or an entry screen. But some games make an extra effort to extend a more visceral invitation. One of the best examples of this is the Guitar Hero controller. A small plastic mock-up of a guitar, when strapped on by a player, suddenly becomes an excuse to *act* like a guitar player, not just play the game, but play the fantasy of the game. Crafting this invitation to play, making it visceral and compelling to your target audience, is an important part of playcentric design.

It might seem obvious that you need to create an engaging invitation to get players interested in playing your game. But there are other decisions you'll need to make about players in your game. For example, how to structure their participation: How many players does the game require? How many total players can the game support? Do various players have different roles? Will they compete, cooperate, or both? The way you answer these questions will change the overall player experience. To answer them, you'll need to look back to your player experience goals and think about what structure will support your goals.

Number of Players

A game designed for one player is essentially different from a game designed for two, four, or 10,000 players. And a game designed for a specific number of players has different considerations than a game designed for a variable number of players.

Solitaire and tic-tac-toe are games that require an exact number of players. Solitaire, obviously, supports only one player. Tic-tac-toe requires two players—no more, no less—the system will not function without the exact number of players. Many single player digital games support only one player. This is because, like solitaire, their structure supports one player competing against the game system.

On the other hand, there are games that are designed to be played with a range of players. Parcheesi is a game designed for two to four players, while Monopoly is designed for two to eight players. Massively multiplayer games like EverQuest or World of Warcraft are designed to function for a variable number of players, ranging into the tens of thousands; however, a single player can be alone in the world of EverQuest, and many of the formal elements of the system will still function.

Exercise 3.2: Three Player Tic-tac-toe

Create a version of tic-tac-toe that works for three players. You might need to change the size of the board or other elements of the game to do this.

Roles of Players

Most games have uniform roles for all players. In chess and Monopoly, there is only one role for all players. But some games have more than one role for players to choose between. In Mastermind, one player chooses to be the code-maker, while the other chooses to be the code-breaker. The system requires both roles to be filled, or it will not work. Also, many

3.1   Costumed players at an EverQuest convention

3.2   Create character screens: World of Warcraft and City of Heroes

team games, like football, have different player roles that make up the full team. Role-playing games, as the name implies, have a variety of roles for players to choose between. Players can take on the role of healers or fighters or magic wielders. These roles define many of the player's basic abilities, and often players will create more than one character in an online world so that they will have the opportunity to play several different roles.

In addition to roles that are defined within the game rules, however, you might also want to consider potential play styles as a type of role when you are designing your game. Richard Bartle, creator of the first multiuser dungeon (MUD), wrote a widely-referenced article describing the four basic player types he found in his MUD. These were: achievers, explorers, socializers, and killers.[1] Bartle posits that players often have a primary play style and will only switch if it suits their purposes. Online worlds such as Second Life offer players a completely open-ended play environment where roles are player defined. This design decision tends to encourage creativity and self-expression rather than competition. So if you are designing a game with different roles for your players, or if you provide the opportunity for players to define their own roles, the nature and balance of these roles will be a critical consideration.

Player Interaction Patterns

Another choice to consider when designing your game is the structure of interaction between a player, the game system, and any other players. The following breakdown of interaction patterns is adapted from the work of E. M. Avedon in his article, "The Structural Elements of Games."[2] You'll see that many digital games fall into the pattern "single player versus game," and, more recently, "multilateral competition." There's a lot of potential in the other patterns that is rarely taken advantage of, and we offer these ideas to you in the hopes that they can inspire you to look at new combinations and possibilities of player interactions to use in your designs.

1.   Single player versus game

This is a game structure in which a single player competes against a game system. Examples include solitaire, Pac-Man, and other single player digital games. This is the most common pattern for digital gaming. You'll find this pattern in arcade games, console games, and PC games. Because there are no other human players in this pattern, games that use it tend to include puzzles or other play structures to create conflict. It is perhaps because of the success of this pattern that we now refer to digital games that have more than one player as "multiplayer" games when, in fact, games have been multiplayer by definition for thousands of years.

Single Player vs. Game

Multiple Individual Players vs. Game

Player vs. Player
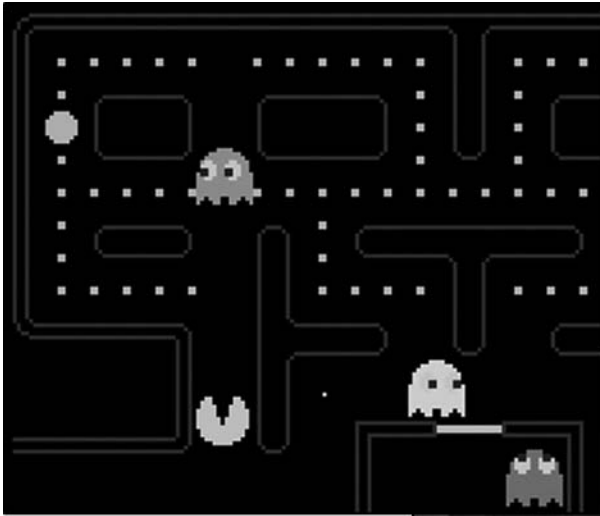
Unilateral Competition

Multilateral Competition

Cooperative Play

Team Competition

3.3   **Player interaction patterns**

3.4 **Single player versus game examples: Pac-Man, The 7th Guest, and Tomb Raider**

Pac-Man © 1980 Namco Ltd. All Rights Reserved. Courtesy of Namco Holding Corp.
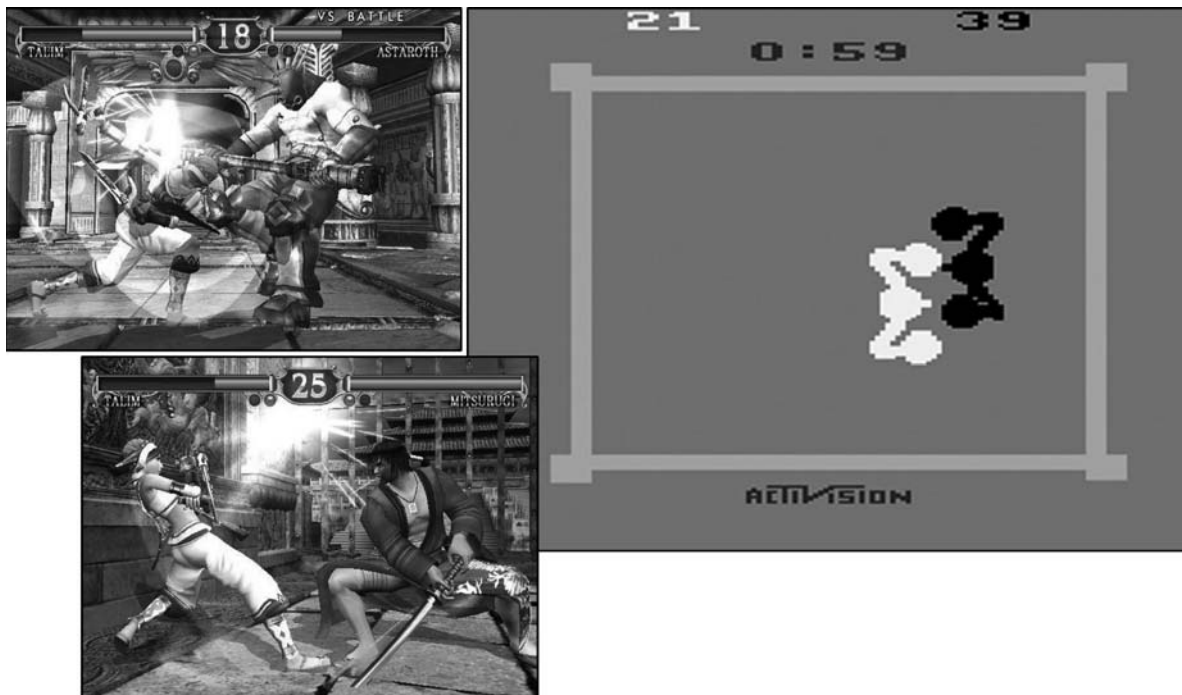
2. Multiple individual players versus game

This is a game structure in which multiple players compete against a game system in the company of each other. Action is not directed toward each other, and no interaction between participants is required or necessary. Examples include bingo, roulette, and Slingo. This is a rarely used pattern in digital gaming, although AOL had a lot of success with their online Slingo game. Essentially, this pattern is a single player game that is played in the company of other players who are also playing the same game. This pattern works well for non-competitive players who enjoy the activity and the social arena (a large percentage of Slingo players are women). This pattern also works well for gambling games.
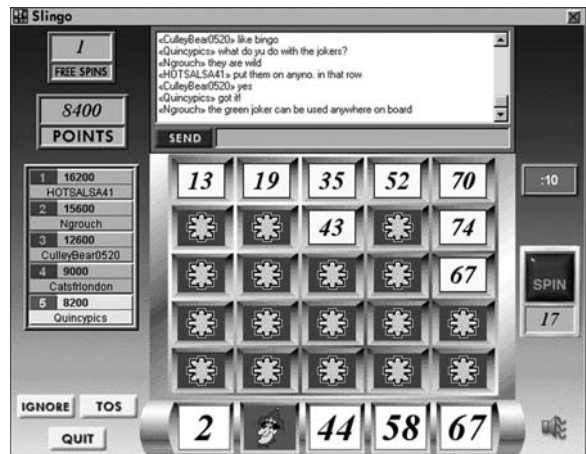
3.5 **Multiple individual players versus game: Slingo**

3.6   Multiple individual players versus game: Boxing for Atari 2600 and Soul Calibur II for Xbox

Soul Calibur II © 2003 Namco Ltd. All Rights Reserved. Courtesy of Namco Holding Corp.

3.   Player versus player

This is a game structure in which two players directly compete. Examples include checkers, chess, and tennis. This is a classic structure for strategy games and works well for competitive players. The one-on-one nature of the competition makes it a personal contest. Two player fighting games such as Soul Calibur II, Mortal Kombat, and others have employed this structure successfully. Again, the intense competition marks this pattern for focused, head-to-head play.

4.   Unilateral competition

This is a game structure in which two or more players compete against one player. Examples include tag, dodge ball, and the Scotland Yard board game. A highly undervalued structure, this pattern works as well with "free for all" games like tag, as it does with intensely strategic games like

3.7   Unilateral competition: Scotland Yard

Scotland Yard. As does tag, Scotland Yard pits one player, Mr. X, against all the other players. However, unlike tag, Scotland Yard has the larger

3.8   Multilateral competition: Super Bomberman and Mario Party

group (the detectives) trying to catch the singled out player (the criminal). This game balances between the two forces because the criminal has full information about the state of the game, while the detectives have to work together to deduce the state from clues left by the criminal. It's a very interesting model for combining cooperative and competitive gameplay that is wide open for digital game development.

5.   Multilateral competition

This is a game structure in which three or more players directly compete. Examples include poker, Monopoly, multiplayer games likes Quake, WarCraft III, Age of Mythology, etc. This is the pattern that most players think of when they refer to "multiplayer" gaming. Nowadays, the trend is to think of multiplayer in terms of massive numbers of players, but as the thousands of years of pre-digital multiplayer game history supports, there's still plenty of room for innovative thinking in terms of smaller, directly competitive groups. Board games with this pattern of player interaction have been "tuned" for generations for groups ranging between three to six players; clearly there's a social force at work that makes this an ideal group size for

direct competition. Want to do something fresh in digital gaming? Try tuning your multiplayer game to encourage the same high level of social interaction that occurs with a three to six person board game.

6.   Cooperative play

This is a game structure in which two or more players cooperate against the game system. Examples include Harvest Time, the Lord of the Rings board game, and cooperative quests in World of Warcraft. This pattern has received a lot of attention in terms of children's board games, like Harvest Time, but not much in games for adults. Reiner Knizia, the prolific German game designer, tackled this pattern in his Lord of the Rings board game, in which a group of players cooperate to save Middle-earth. Also, role-playing games often feature cooperative quests within a competitive game structure. It could also be argued that Second Life's noncompetitive, creative environment is a form of cooperative play. It would be interesting to see more designers experiment with this approach.

7.   Team competition

This is a game structure in which two or more groups compete. Examples include soccer, basketball,

3.9   Cooperative play: Lord of the Rings board game

charades, Battlefield 1942, and Tribes. Team sports have proved the power of this pattern of player interaction over and over, not only for the players but for a whole other group of participants—the fans. As if responding to the need for this particular multiplayer pattern, teams (called clans or guilds) sprang up almost immediately upon the introduction of multiplayer and massively multiplayer digital games. The multiplayer features introduced in Halo 2 include custom games in which players can define their own rules and teams. Think about your own experiences with team play—what makes team play fun? What makes it different from individual competition? Is there an idea for a team game that comes from your answers to those questions?

Exercise 3.3: Interaction Patterns

For each of the interaction patterns, create a list of your favorite games in each pattern. If you can't think of any games in a particular pattern, research games in that area and play several of them.

3.10   Team competition: Halo 3

Persuasive Games

by Ian Bogost

Ian Bogost is a professor of digital media at the Georgia Institute of Technology and founding partner at Persuasive Games LLC. He is the author of Unit Operations: An Approach to Videogame Criticism *and* Persuasive Games: The Expressive Power of Videogames.

How do video games express ideas? Without understanding how games can be expressive in a general sense, it is hard to understand how they might be persuasive. And how do video games make arguments? Video games are different from oral, textual, visual, or filmic media, and thus when they try to persuade, they do so in a different fashion from speech, writing, images, or moving images.

How Video Games Express Ideas

Video games are good at representing the behavior of systems. When we create video games, we start with some system in the world—traffic, football, whatever. Let's call this the "source system." To create the game, we build a model of that source system. Video games are software, so we build the model by authoring code that *simulates* the behavior we want to focus on. Writing code is different from writing prose or taking photographs or shooting video; code models a set of potential outcomes, all of which conform to the same general rules. One name for this type of representation is *procedurality* (Murray, 1997); procedurality is a name for a computer's ability to execute rule-based behaviors. Video games are a kind of procedural representation.

Consider some examples: Madden Football is a procedural model of the sport of American football. It models the physical mechanics of human movement, the strategy of different sets of plays, and even the performance properties of specific professional athletes. SimCity is a procedural model of urban dynamics. It models the social behavior of residents and workers, as well as the economy, crime rate, pollution level, and other environmental dynamics.

So in a video game we have a source system and a procedural model of that source system. A player needs to interact with the model to make it work—video games are interactive software; they require the player to provide input to make the procedural model work. When players play, they form some idea about the modeled system and about the source system it models. They form these ideas based on the way the source system is simulated; that is to say, there might be many different ways of proceduralizing a system. One designer might build a football game about the strategy of coaching, while another might build one about the duties of a particular field position, such as a defensive lineman. Likewise, one designer might build a city simulator that focuses on public services and new urbanism (Duany et al., 2003), while another might focus on Robert Moses-style suburban planning. This is not just a speculative observation: It highlights the fact that the source system never really exists as such. One person's idea of football or a city or any other subject for a representation of any kind is always *subjective*.

The inherent subjectivity of video games creates dissonances, gaps between the designer's procedural model of a source system and the players' subjectivity, their preconceptions and existing understanding of that simulation. This is where video games become expressive: They encourage players to interrogate and reconcile their own models of the world with the models presented in a game.

How Video Games Persuade

Most of the time, video games create procedural models of fantasy lives, like that of the pro ballplayer (Madden), or a blood elf (World of Warcraft), or a space marine (DOOM). But we can also use this facility to invite the player to see the ordinary world in new or different ways. One way to use video games in this fashion is for persuasion, to make arguments about the way the world works.

Consider a game we created at my company, Persuasive Games. Airport Insecurity (Persuasive Games 2005) is a mobile game about the Transportation Security Administration (TSA). In the game, the player takes the role of a passenger at any of the 138 most trafficked airports in the United States. The gameplay is simple: The player must progress through the security line in an orderly and dignified fashion, taking care not to lag behind when space opens in front of him, as well as to avoid direct contact with other passengers. When he reaches the X-ray check, the player must place his luggage and personal items on the belt. The game randomly assigns luggage and personal items to the player, including "questionable" items like lighters and scissors, as well as legitimately dangerous items like knives and guns.
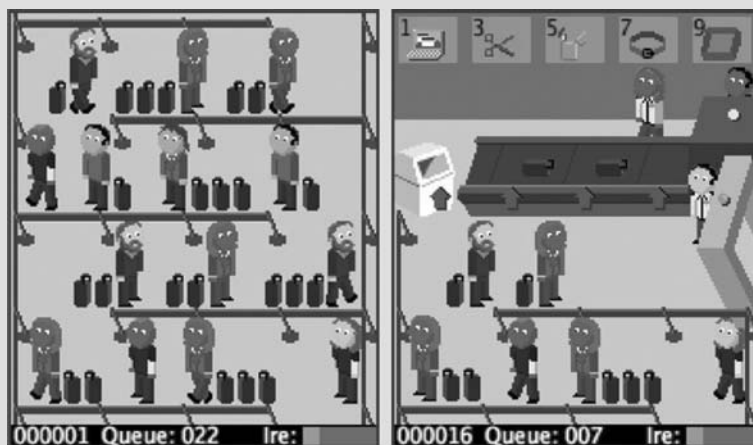
Airport Insecurity

For each airport, we gathered traffic and wait time data to model the flow of the queues, and we also gathered as much as we could find in the public record on TSA performance. Government Accountability Office (GAO) analysis of TSA performance used to be reported publicly, but the agency reportedly started classifying the information after it became clear that it might pose a national security risk. The upshot of such tactics is that the average citizen has no concept of what level of security they receive in exchange for the rights they forego. While the U.S. government wants its citizens to believe that increased protection and reduced rights are necessary to protect us from terrorism, the effectiveness of airport security practices is ultimately uncertain. The game made claims about this uncertainty by modeling it procedurally: The player got to choose if they would dispose of their dangerous items in a trash can near the X-ray belt or if they would test the limits of the screening process by carrying them through.

Consider another example, this one a live action game played via text messaging on mobile phones in a real world environment. Cruel 2 B Kind, which ubiquitous game researcher and designer Jane McGonigal and I created, is a modification of games like Assassin where players attempt to surreptitiously eliminate

each other with predetermined weapons like water pistols. But in Cruel 2 B Kind, players "kill with kindness." Each player is assigned a "weapon" and "weakness" that corresponds with a common, even ordinary pleasantry. For example, players might compliment someone's shoes or serenade them. While Assassin is usually played in closed environments like college dorms, Cruel 2 B Kind is played in public on the streets of New York City or San Francisco or anywhere in the world.

Cruel 2B Kind

Players not only don't know who their target is, they also don't know who is playing. In these situations, players are forced to use guesswork or deduction to figure out who they might target. As a result, players often "attack" the wrong groups of people or people who are not playing at all. The reactions to such encounters are startling for all concerned; after all, exchanging anonymous pleasantries is not something commonly done on the streets of New York. Cruel 2 B Kind asks the player to layer an alternative set of social practices atop the world they normally occupy. Instead of ignoring their fellow citizens, the game demands that players interact with them. This juxtaposition of game rules and social rules draws attention to the way people do (or more properly, don't) interact with one another in everyday life.

Disruptive and Strange

Persuasive games model ideas about the world and how it works in the subjective opinion of the game's designer. As players, we come to a video game with an idea of the world and how it works. A game presents a model of that same world, but that model has its own properties that likely differ from the player's. When we put the two models together, we can see where they converge and diverge—this is what we do when we play games critically. Procedural arguments can do just this: produce player deliberation, not by making those arguments seamless and comfortable, but rather by making them disruptive and strange.

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Objectives

Objectives give your players something to strive for. They define what players are trying to accomplish within the rules of the game. In the best-case scenario, these objectives seem challenging—but achievable—to the players. In addition to providing challenge, the objective of a game can set its tone. A game in which the objective is to capture or kill the opponent's forces will have a very different tone from a game in which the objective is to spell more or longer words.

Some games are constructed so that different players have different objectives, while other games allow the player to choose one of several possible objectives, and still others allow players to form their own objectives as they play. Additionally, there might be partial objectives, or miniobjectives, in a game that help the players to accomplish the main objective. In any case, the objective should be considered carefully because it affects not only the formal system of the game but also the dramatic aspects. If the objective is well integrated into the premise or story, the game can take on strong dramatic aspects.

Some questions to ask yourself about objectives as you design your own games are:

- What are some objectives of games you have played?
- What impact do these objectives have on the tone of the game?
- Do certain genres of play lend themselves to certain objectives?
- What about multiple objectives?
- Do objectives have to be explicit?
- What about player-determined objectives?

Here are some examples of objectives from games you might have played:

- *Connect Four:* Be the first player to place four units in a contiguous line on the playing grid.
- *Battleship:* Be the first player to sink all five of your opponent's ships.
- *Mastermind:* Deduce the secret code of four colored pegs in as few steps as possible.

- *Chess:* Checkmate your opponent's king.
- *Clue:* Be the first player to deduce who, where, and how a murder was committed.
- *Super Mario Bros.:* Rescue Princess Toadstool from the evil Bowser by completing all eight worlds (32 levels) of the game, each of which have their own miniobjectives.
- *Spyro the Dragon:* Rescue your fellow dragons who have been turned to stone, and defeat the evil Gnasty Gnorc by completing all six worlds of the game, each of which have their own miniobjectives.
- *Civilization:* Option 1: conquer all other civilizations on the board, or Option 2: colonize the star Alpha Centauri.
- *The Sims:* Manage the lives of a virtual household; as long as you can keep your household alive, you can set your own goals for the game.

Are there any generalizations we can make about the types of objectives that might help us in our design process? A number of game scholars have made attempts to categorize games by their objectives. Here are some of the categories they defined.[3]

1. Capture

The objective in a capture game is to take or destroy something of the opponent's (terrain, units, or both), while avoiding being captured or killed. Examples of this type of game are strategy board games like chess and checkers, as well as action games like Quake, SOCOM II, and their brethren. Also in this category are real-time strategy games like the WarCraft series and Command & Conquer. There are, in fact, so many examples of games with this type of objective that it is difficult to make any generalizations. Suffice to say that the concept of capture or killing the opponent's forces is one that is deeply ingrained in games today and has been since antiquity.

3.11   Capture or kill: SOCOM II and DOOM

2.   Chase

The objective in a chase game is to catch an opponent or elude one, if you are the player being chased. Examples of chase games include tag, Fox & Geese, Assassin, and Maximum Chase. Chase games can be structured as single player versus game, player versus player, or unilateral competition. For example, tag and Fox & Geese are unilateral competitions, or one player versus many. Assassin is player versus player with each player chasing and being chased simultaneously. And Maximum Chase, an Xbox game, is player versus game, with the player in pursuit of computer-controlled enemy cars. Chase games can be determined by speed or physical dexterity, as in tag and Maximum Chase, or by stealth and strategy, as in Assassin. Also, a game like Scotland Yard, discussed on page 54, is a chase game that is determined by logic and deduction. There is clearly a wealth of possibilities for games using this type of objective.

3.   Race

The objective in a race game is to reach a goal—physical or conceptual—before the other players. Examples could be a footrace, a board game like Uncle Wiggly or Parcheesi, or a simulation game like Virtua Racing. Race games can be determined by physical dexterity (such as with the footrace and, to some extent, Virtua Racing) or chance (such as with Uncle Wiggly and Parcheesi). They can also be determined by a mix of strategy and chance, such as in backgammon.

4.   Alignment

The objective in an alignment game is to arrange your game pieces in a certain spatial configuration or create conceptual alignment between categories of pieces. Examples include tic-tac-toe, solitaire, Connect Four, Othello, Tetris, and Bejeweled. Alignment games are often somewhat puzzle-like in that they involve solving spatial or organizational problems to achieve the goal. They can be determined by logic and calculation, as in Othello and Pente, or by chance opportunity combined with calculation, as in Tetris and Bejeweled. Conceptual alignment is used in many games that require the players to make matches or sets of game pieces.

5.   Rescue or escape

The objective in a rescue or escape game is to get a defined unit or units to safety. Examples are Super Mario Bros., Prince of Persia 3D, Emergency Rescue: Firefighters, and Ico. This objective is often combined with other partial objectives. For example, in Super Mario Bros., the overall objective, as mentioned previously, is to rescue the Princess. But each of the game levels also has their own objectives that are more puzzle-like (see Solution on page 64).

3.12   Chase games: Maximum Chase

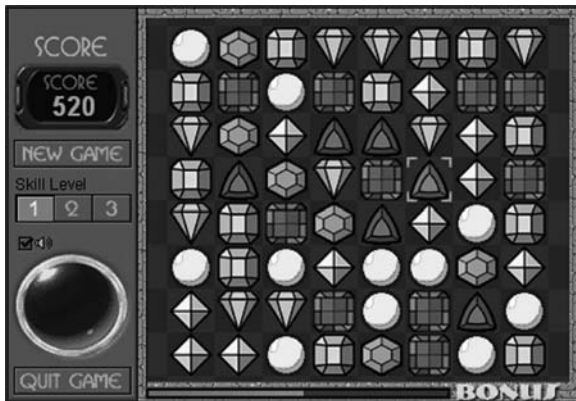*Maximum Chase trademark Microsoft Corporation*

3.13   Race games: Pole Position and Gran Turismo 4

Pole Position © 1982 Namco Ltd. All Rights Reserved. Courtesy of Namco Holding Corp.

6.   Forbidden Act

The objective in a forbidden act game is to get the competition to break the rules by laughing, talking, letting go, making the wrong move, or otherwise doing something they shouldn't. Examples include Twister, Operation, Ker-Plunk!, and Don't Break the Ice. This is an interesting game type that isn't often found in digital games, perhaps because of its lack of direct competition or the difficulty in monitoring fair play. From the examples it is clear to see that there is often a physical component to games with this objective, sometimes involving stamina or flexibility, and sometimes just plain chance.

Not included in the work of the scholars mentioned previously, but interesting nonetheless, are objectives such as the following items.

7.   Construction

The object in a construction game is to build, maintain, or manage objects; this might be within a directly competitive or indirectly competitive environment. This, in many instances, is a more sophisticated version of the alignment category. Examples of this type of game are simulation games like Animal Crossing, Gazillionaire, SimCity, or The Sims, or board games like Settlers of Catan. Games with a

3.14   Alignment: Bejeweled

3.15   Rescue or escape: Prince of Persia 3D

3.16   Forbidden act: Milton Bradley's Operation
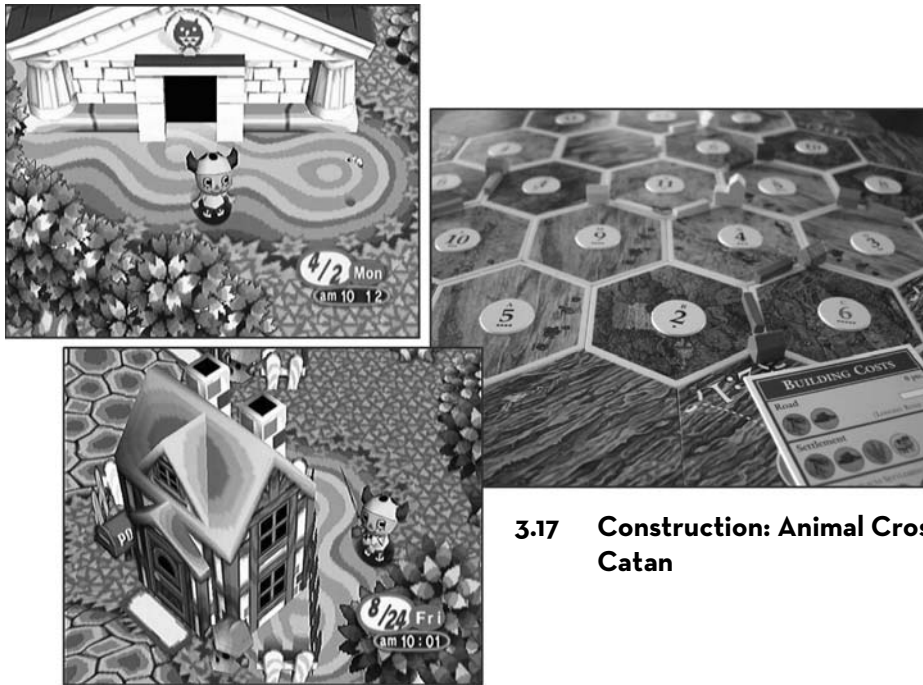
3.17   **Construction: Animal Crossing and Settlers of Catan**

construction objective often make use of resource management or trading as a core gameplay element. They are usually determined by strategic choice making rather than chance or physical dexterity. Also, construction games can often be left open to player interpretation as to what ultimate success is within the game; for example, players choose what type of city to build in SimCity or what household to encourage in The Sims.
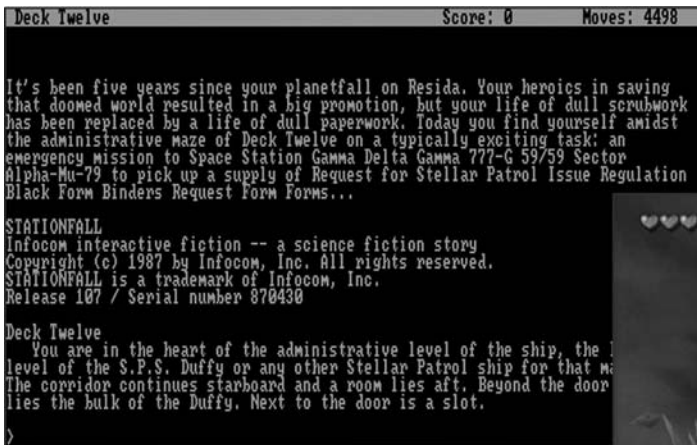
8.   Exploration

The object in an exploration game is to explore game areas. This is almost always combined with a more competitive objective. In the classic game of exploration, Colossal Cave Adventure, the objective is not only to explore Colossal Cave but also to find treasure along the way. In games like the Zelda series, the objectives of exploration, puzzle solving, and sometimes combat intertwine to form multifaceted gameplay. Online worlds like Ultima and EverQuest have also used exploration as one of several objectives in their game structures.
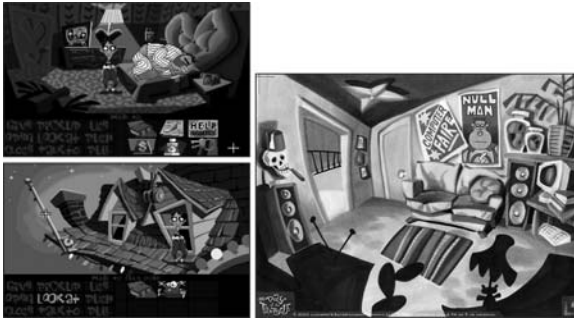
9.   Solution

The object in a solution game is to solve a problem or puzzle before (or more accurately) than the competition. Examples include graphic adventures like the Myst series, text adventures like the classic Infocom titles, and many games that fall into other categories but have puzzle qualities. These include some we have mentioned already: the Mario and Zelda games, Tetris, and The Sims. Some games of pure strategy fall into this puzzle-like category as well: Connect Four and tic-tac-toe.

10.   Outwit

The object in a game of wits is to gain and use knowledge in a way that defeats the other players. Some games of this type focus on having extra-game knowledge, like in Trivial Pursuit or Jeopardy! Others focus on gaining or using in-game knowledge, such as Survivor and Diplomacy. This second type of game provokes interesting social dynamics, which have yet to be truly explored in digital games.

3.18   Exploration: Stationfall and The Legend of Zelda: The Wind Waker

3.19   Solution: Day of the Tentacle

3.20   Outwit: Diplomacy

Summary

This list is by no means exhaustive, and one of the most interesting things about objectives in games is when they are mixed in interesting ways. For example, the genre of real-time strategies mixes war with construction, forming a split focus that appeals to gamers who might not be attracted to either pure war games or pure construction games. What you can do with a list like this is use it as a tool to look at the types of objectives you like in games, as well as those you do not like, and see how you might use these objectives in your own game ideas.

Exercise 3.4: Objectives

List ten of your favorite games and name the objective for each. Do you see any similarities in these games? Try to define the type or types of games that appeal to you.

PROCEDURES

As discussed in Chapter 2, procedures are the methods of play and the actions that players can take to achieve the game objectives. One way to think about procedures is: Who does what, where, when, and how?

- Who can use the procedure? One player? Some players? All the players?
- What exactly does the player do?
- Where does the procedure occur? Is the availability of the procedure limited by location?
- When does it take place? Is it limited by turn, time, or game state?
- How do players access the procedure? Directly by physical interaction? Indirectly through a controller or input device? By verbal command?

There are several types of procedures that most games tend to have:

- *Starting action:* How to put a game into play.
- *Progression of action:* Ongoing procedures after the starting action.
- *Special actions:* Available conditional to other elements or game state.
- *Resolving actions:* Bring gameplay to a close.

In board games, procedures are usually described in the rule sheet and put into action by the players. In digital games, however, they are generally integrated into the control section of the manual because they are accessed by the player via the controls. This is an important way in which procedures differ from rules because rules might actually be hidden from the player in a digital game, as we'll discuss on page 68. Here are some examples of procedures from both a board/tabletop game and a digital game.

Connect Four

1. Choose a player to go first. Each player chooses a color: red or black.
2. On each turn, a player drops one colored checker down any of the slots in the top of the grid.
3. The play alternates until one of the players gets four checkers of one color in a row. The row can be horizontal, vertical, or diagonal.

Super Mario Bros.[4]

Select button: Use this button to select the type of game you wish to play.

Start button: Press this button to start the game. If you press it during play, it will pause/unpause the game.

Left arrow: Walk to the left. Push button B at the same time to run.

Right arrow: Walk to the right. Push button B at the same time to run.

Down: Crouch (Super Mario only).

A Button

Jump: Mario jumps higher if you hold the button down longer.

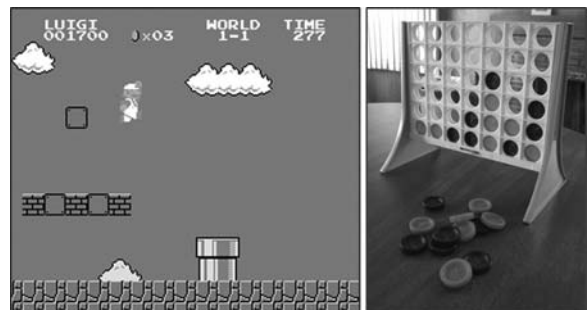*Swim:* When in water, press this button to bob up.

B Button

Accelerate: Press this button to run. While holding B, if you press A to jump, you can jump higher.

Fireballs: If you pick up a fire flower, you can use this button to throw fireballs.

Comparison

Notice that both Connect Four and Super Mario Bros. specify a starting action. The progression of action in Connect Four is clearly shown in steps 2 and 3, while in Super Mario Bros., real time game, the progression is implied by the left and right walk commands, which move the player through the game. Connect Four doesn't have any special actions, but Super Mario Bros. has commands that are only appli-

3.21   Super Mario Bros. and Connect Four

cable in certain situations; that is, "when in water press this button to bob up," and "if you pick up a fire flower, you can use this button to throw fireballs." Connect Four also states the resolving action: when one player gets four checkers in a row. Super Mario Bros. does not state the resolving action; this is because the resolution is adjudicated by the system, not the players.

Exercise 3.5: Procedures for Blackjack

List the procedures for blackjack. (If you don't know this game, choose another game you are familiar with.) Be specific. What is the starting action? The progression of action? Any special actions? The resolving action?

System Procedures

Digital games can have much more complex game states than nondigital games. They can also have multifaceted system procedures that work behind the scenes, responding to situations and player actions. In a role-playing combat system, character and weapon attributes can be used as part of a system calculation determining whether a particular player action succeeds, and if so, how much damage it causes. If the game were to be played on paper, as many role-playing games are, these system procedures need to be calculated by the players, using dice to generate random numbers. If the game is played digitally, the same system procedures are calculated by the program rather than the players.

3.22   SSX Tricky: Learn the trick procedures to score "Tricky Points"

Because of this, digital games can involve more sophisticated system procedures and process them more quickly than nondigital games. This does not mean that digital games are more complex than non-digital games. When we discuss system structures in Chapter 5 on page 115, we'll look at systems that have simple procedures that lead to extremely complex results. For example, games like chess or Go are non-digital systems that have intrigued players for centuries with their innate complexity, all of which stems from the relationship of very simple game objects and the procedures for manipulating them.

Defining Procedures

When you are defining the procedures for your game, it's important to keep in mind the limitations of the environment in which your game will be played. Will your game be played in a nondigital setting? If so, you will want to make sure the procedures are easy for players to remember. If your game will be played in a digital setting, what type of input/output devices will that setting have? Will players have a keyboard and mouse, or will they have a proprietary controller? Will they sit close to a high-resolution screen or several feet from a low-resolution screen?

Procedures are, by nature, affected by these physical constraints. As a designer, you need to be sensitive to constraints and find creative and elegant solutions so that the procedures are intuitive to access and easy to remember. These types of questions will be addressed in more detail in Chapter 8, when we discuss the prototyping of interfaces and controls for digital games.

Rules

We said in the last chapter that rules define game objects and allowable actions by the players. Some of the questions we might ask ourselves about rules are: How do players learn the rules? How are the rules enforced? What kinds of rules work best in certain situations? Are there patterns to rule sets? What can we learn from those patterns?

Like procedures, rules are generally laid out in the rules document of board games. In digital games, they can be explained in the manual or they can be implicit in the program itself. For example, a digital game might not allow certain actions without explicitly stating that fact; the interface might simply not provide controls for such an action, or the program might stop a player from performing that action if it is attempted.

Rules can also close up loopholes in the game system. One classic example of this is the famous rule from Monopoly: "Do not pass Go, do not collect $200." This rule is applied when a player is sent to jail from any spot on the board. It is important because if it was not stated, a player could make the argument that moving past "Go" all the way to jail entitled him to collect $200, transforming the intended punishment into a reward.

When you are designing rules, as when you are designing procedures, it's important to think of them in relation to your players. Too many rules might make it difficult for the players to manage their understanding of the game. Leaving rules unstated or poorly communicating them might confuse or alienate players. Even if the game system (in the case of a digital game) is tracking the proper application of rules, the players need to clearly understand them so that they do not feel cheated by the consequences of certain rules.

Here are some sample rules from several different types of games that we can use as reference for the following discussion:

- *Poker:* A straight is five consecutively ranked cards; a straight flush is five consecutively ranked cards of the same suit.
- *Chess:* A player cannot move her king into check.
- *Go:* A player cannot make a move that recreates a previous state of the board—this means an exact replication of the whole board situation.
- *WarCraft II:* To create knight units, a player must have upgraded to a keep and built a stable.
- *You Don't Know Jack:* If a player answers a question incorrectly, the other players get a chance to answer.

- *Jak and Daxter:* If a player runs out of green mana, they are "knocked out" and return to the last checkpoint of the level.

Even from this short list, there are some generalities that start to emerge concerning the nature of rules, which are discussed below.

Rules Defining Objects and Concepts

Objects in games have a unique status and meaning that is different from objects in the real world. These game objects, defined as part of the game's rule set, can be completely fabricated, or they can be based on real world objects. But even if they are based on familiar objects, they are only abstractions of those objects and still need to be defined in the rules as to their nature in the game.

Think about the poker rule regarding the concept of a straight or a straight flush. This is a concept unique to the game. There is no straight outside of the realm of poker. When you learn the rules of poker, one of the key concepts to learn is the makeup and values of certain hands—a straight being one of these hands.

Then again, there is chess. We know that chess has objects in its system called kings, queens, bishops, etc., all of which have counterparts in the real world. But this is misleading; the king in a chess game is an abstract object with explicit rules defining its nature. A king outside of the game bears no resemblance to this abstract game object. The rules of chess have simply used the notion of a king to give context to the behavior and value of this important piece.

Board games and other nondigital games generally define their objects explicitly as a part of their rules sets. Players must read and understand these rules, and then they have to be able to adjudicate the game themselves. Because of this, most nondigital games limit themselves to fairly simple objects, with only one or two possible variables or states for each, usually denoted by some physical aspect of the equipment, board, or other interface elements. In a board game like chess, the variables for each piece are rank, color, and position, each of which the player can visibly track.

Digital games, on the other hand, can have objects, such as characters or fighting units that are made up of a fairly complex set of variables that define their overall state. Players might not be aware of this entire state because, unlike a board game, the program can track the variables behind the scenes. For example, here are the default variables underlying both knights and ogres in WarCraft II:

- Cost: 800 gold, 100 lumber
- Hit Points: 90
- Damage: 2–12
- Armor: 4
- Sight: 5
- Speed: 13
- Range: 1

While these variables are important to how the play proceeds, and they are in fact available to players via the interface, they are not something that players must directly manage and update. Even the most advanced player probably does not consistently calculate their strategy using these mathematical variables. Rather, they gain an intuitive knowledge of the knight's cost, strength, power, range, etc., versus the other units on the board through their play experience.

When defining your game objects and concepts, an essential thing to keep in mind is how players will learn the nature of these objects. If the objects are complex, will the players have to deal with that complexity directly? If the objects are simple, will players feel they are differentiated enough from each other to make an impact on the gameplay? Do the objects evolve? Are they only available under certain circumstances? How will players learn the nature of each object in the game? One interesting point to note is the way in which the laws of the physical world allow many nondigital games to compress a lot of complexity in their description of game objects. For example, the effect of gravity in Connect Four is used to create an implicit rule about how players can place pieces on the board.

Rules Restricting Actions

The next general rule concept we can see reflected in our list of sample rules is the idea of rules restricting actions. In chess, the rule that "a player cannot move

| Unit Properties					
	Knight	Ogre	Elven Archer	Troll Axethrower	Mage
Visible Range:	4	4	5	5	9
Hit Points:	90	90	40	40	60
Magic Points:	0	0	0	0	1
Build Time:	90	90	70	70	120
Gold Cost:	800	800	500	500	1200
Lumber Cost:	100	100	50	50	0
Oil Cost:	0	0	0	0	0
Attack Range:	1	1	4	4	2
Armor:	4	4	0	0	0
Basic Damage:	8	8	3	3	0
Piercing Damage:	4	4	6	6	9

3.23   WarCraft II—Unit properties

their king into check" keeps players from losing the game by accident. The example from Go where "a player cannot make a move that recreates a previous state of the board" keeps the players from becoming locked in a never ending loop of play. Both of these address potential loopholes in the game systems.

Additionally, rules restricting actions can take the form of basic delimitations: "the play takes place on a field of 360 × 160 feet" (football) or "a team shall be composed of not more than 11 players, one of whom shall be the goalkeeper" (soccer). In both of these cases, we can see that the rules overlap with other formal aspects—namely the number of players and the boundaries of the game. This is actually true of all formal aspects, which will be represented in either the procedures or the rules in some way.

Another example of rules that restrict actions is in the type of rules that keep gameplay from becoming imbalanced in one or more players' favor. Think about the effects of the rule from WarCraft II where "in order
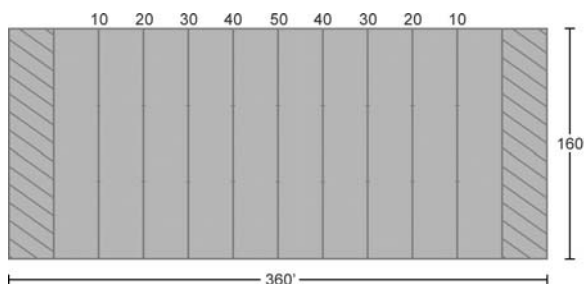
3.24   Dimensions of a football field

to create knight units, a player must have upgraded to a keep and built a stable." What this means is that one player cannot simply choose to use their resources early in the game to create knights, while other players are still creating lower-level fighting units. All players must progress along a fairly similar path of resource management to gain more powerful units.

Exercise 3.6: Rules Restricting Actions

There are many types of rules that restrict action. Here is a list of games: Twister, Pictionary, Scrabble, Operation, and Pong. What rules within these games restrict player actions?

Rules Determining Effects

Rules also can trigger effects based on certain circumstances. For example, "if" something happens, there is a rule that "xyz" results. In our list of sample rules, the condition from You Don't Know Jack falls into this type of rule: "If a player answers a question incorrectly, the other players get a chance to answer." Also, this rule from Jak and Daxter is of the same quality: "If a player runs out of green mana, they are 'knocked out' and return to the last checkpoint."

Rules that trigger effects are useful for a number of reasons. First, they create variation in gameplay. The circumstances that trigger them are not always

3.25   Jak II—Almost out of mana

applicable, so it can create excitement and difference when they come into play. The example from You Don't Know Jack shows this quality. In this case, the second player gets a chance to answer the question, already having seen the results of the first player's guess. Because of this, they have an advantage, a higher percentage chance of answering correctly.

Additionally, this type of rule can be used to get the gameplay back on track. The rule from Jak and Daxter shows this. Because the game is not competitive in the sense that it is a single player adventure, there is no reason for the player to "die" when they lose all their mana. However, the designers want the player to be penalized in some way so that they will take care with their actions and try to keep from losing mana. Their solution is the previous rule: Players are penalized, but not badly, for losing all their mana. This gets the game back on track, incentivizing the players to work harder to keep their mana loss in check.

Defining Rules

As with procedures, the way in which you define your rules will be affected by your play environment. Rules need to be clear to players, or, in the case of digital games that adjudicate for players, they need to be intuitively grasped so that the game seems fair and responsive to given situations. In general, it is important to keep in mind that the more complex your rules are, the more demands you will place on the players to comprehend them. The less well that players understand your rules, whether rationally or intuitively, the less likely they will be able to make meaningful choices within the system and the less sense they will have of being in control of the gameplay.

Exercise 3.7: Rules for Blackjack

In the same way that you wrote down the procedures for blackjack in Exercise 3.5, now write down the rules. It is harder than you think. Did you remember all the rules? Try playing the game as you have written it. You might realize that you have forgotten something. What rules did you forget? How did those missing rules affect the play of the game?

RESOURCES

What exactly is a resource? In the real world, resources are assets (i.e., natural resources, economic resources, human resources) that can be used to accomplish certain goals. In a game, resources play much the same role. Most games use some form of resources in their systems, such as chips in poker, properties in Monopoly, and gold in WarCraft. Managing resources and determining how and when to control player access to them is a key part of the game designer's job.

How does a designer decide what resources to offer to players? And how does a player control access to those resources to maintain challenge in the game? This is a hard question to answer in the abstract. It is easier if we take an example that you are probably familiar with.

Think of a role-playing game like Diablo II. What are some of the resources you might find in such a system: money, weapons, armor, potions, magic items? Why don't you find things like paper clips or pieces of sushi? While it might be fun to find such random items, the truth is, a piece of sushi won't help you to achieve the goals of the game. The very same items might actually have useful value in another game. For example, in Katamari Damacy, which was discussed in Chapter 1 on page 10, paper clips and sushi are just two of the quirky types of game resources you need to deal with. In this game, the main value of these resources lies in their size relative to your katamari, or "sticky ball." In each of these examples, the designers have carefully planned how you can find or earn the very resources that you need to accomplish the goals they have put before you. You might not find or earn as much money as you would like, but if you meet the challenges the game presents, you will gain resources that will allow you to move forward. If you did not gain these resources, the game system would be unbalanced.

By definition, resources must have both utility and scarcity in the game system. If they do not have utility, they are like our example of sushi in Diablo II: a funny and strange thing to find, but essentially useless. On the same note, if the resources are overly abundant, they will lose their value in the system.

Exercise 3.8: Utility and Scarcity

What are the resources in the games Scrabble and DOOM? How are they useful to players? How are they made scarce by the game system?

Many designers fall into the trap of copying existing games when it comes to resource management. One way to break your game away from the tried and true is to think about resources in a more abstract sense. Look at the basic functions of resource types and try to apply them in new and creative ways. To illustrate what we mean, let's review some example resource types that you should consider when designing your game.

Lives

The classic resource in action games are lives. Arcade games are built on the management of this primary resource. Examples of this are games like Space
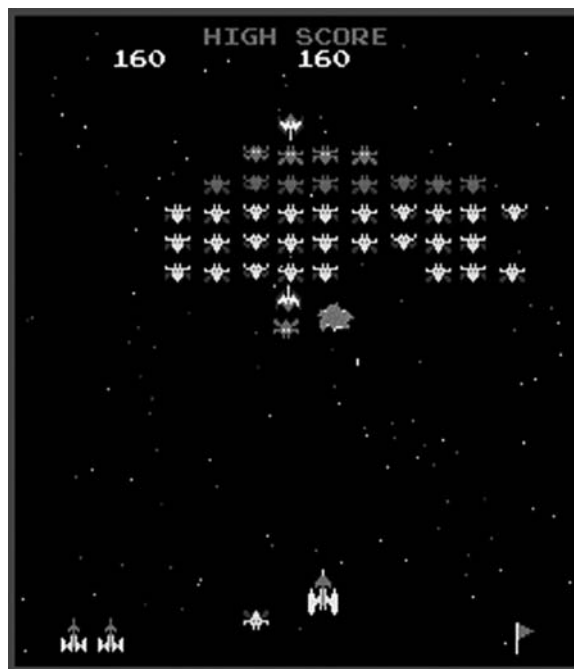
3.26   Galaxian: Two lives left

Galaxian (©) 1979 Namco Ltd., All Rights Reserved. Courtesy of Namco Holding Corp.

Invaders or Super Mario Bros., where you have a certain number of lives to accomplish the goals of the game. Lose your lives, and you have to start over. Do well, and you earn more lives to work with. Lives as a resource type are usually implemented as part of a fairly simplistic pattern: More is always better, and there's no downside to earning lives.

Units

In games in which the player is represented in the game by more than one object at a time, they generally have unit resources to manage rather than lives. Units can be all of one kind, as in checkers, or a number of different types, as in chess. Units can keep the same values throughout the game, or they can upgrade or evolve, as in real time strategy games. Units can be finite (i.e., when they are lost, they are

lost for good), or they can be renewable, as in games that allow players to build new units over time. When units are renewable, they often have an associated cost per unit. Determining this cost per unit and how it balances with the rest of the resource structure can be tricky. Playtesting is the one good way to determine if your cost per unit is balanced.

Health

Health can be a separate resource type, or it can be an attribute of an individual life in a game. No matter how it is thought of, when health is used as a resource, it helps to dramatize the loss or near loss of lives and units. Using a resource like health usually means that there is some way to increase health, even as it is lost as part of gameplay.

How might players raise health levels in a game? Many action games place medical kits around their levels—picking one up raises a player's health. Some role-playing games force players to eat or rest to heal their characters. Each of these methods has its uses in a particular genre. The action game uses a method that is very fast, while being somewhat unrealistic. The role-playing example is more realistic within the story aspect of the game, but it is slow and potentially frustrating to players.

3.27   Checkers: Simple units

3.28   Diablo—Low health meter on lower left of screen

Currency

One of the most powerful resource types in any game is the use of currency to facilitate trade. As we'll see in Chapter 5 on page 122, currency is one of the key elements of an in-game economy. It is not the only way to create an economy—many games also use barter systems to accomplish the same goals. Currency in games plays the same role it does in real life: It greases the wheels of trade, making it easier for players to trade for what they need without having to barter using only the goods they have on hand. Currency need not be limited to a standard bank note system, however.

Actions

In some games, actions, such as moves or turns, can be considered resources. An example of this is the game of 20 Questions. Your questions have utility and scarcity in this system, and you have to ration them carefully to guess the answer within your limit. Another example is the phase structure of the turns in Magic: The Gathering. Each turn is made up of phases; some specific actions can be performed in each phase. Players must plan their turns carefully to not waste any potential actions.

Even real time games can restrict actions that are too powerful, and by doing so, these actions

3.29   Ultima Online—Player knapsack with sack of gold

3.30   Enter the Matrix—Focus

become resources that need to be managed by the players. An example of this can be seen in Enter the Matrix, where the "focus" feature allows the player to enter "bullet time," a mode that slows down the action so the player's avatar can move more quickly relative to the opponent. You have only so much time to focus, however, before you return to normal time. Managing the use of your focus time is a key part of gameplay.

Power-ups

One classic type of resource is the power-up. Whether it is magic mushrooms in Super Mario Bros. or blue eco in Jak and Daxter, power-ups, as their name implies, are generally objects that give a boost of some sort to the player. This boost can increase

3.31   Super Mario Bros.—Magic mushroom

size, power, speed, wealth, or any number of game variables. Power-up objects are generally made scarce, so that finding them doesn't make the game too easy. Power-ups are also generally temporary, limited in number, available for only a short time, or useful only in certain game states.

Inventory

Some game systems allow players to collect and manage game objects that are not power-ups or units. As a generic term, we are calling these game objects "inventory" after the way in which they are usually managed. We've already mentioned the armor, weapons, and other objects found in role-playing games such as Diablo II. These objects help players to accomplish game objectives, and they are made scarce by their high price at purchase or by the opportunity cost of finding them in dungeons guarded by more and greater monsters. The concept of an inventory of game objects is not limited to role-playing games: trading card games like Magic: The Gathering ask players to manage their inventory of cards, limiting the number of cards they can have in their playing deck. Additionally, objects like ammunition or weapons can also be thought of as inventory. Like all of the other types of resources mentioned above, inventory objects must have utility and scarcity so that players are making meaningful choices when managing these objects.

Special Terrain

Special terrain is used as a resource in an important part of some game systems, especially those that are map-based systems, such as strategy games. In games like WarCraft III, the currency of the game (wood, gold) is extracted from special areas of the terrain, so these areas become important primary resources. Other types of games can also use terrain as a resource in ways you might not have thought of. The triple letter squares in Scrabble are important resources found on the terrain of the game board, as are the bases on the diamond of a baseball field.

3.32   Scrabble—Triple letter score

Time

Some games use time as a resource—restricting player actions by time or phases of the game in periods of time. A good example of time used as a resource can be seen in speed chess, where players have a total amount of time (for example, 10 minutes) to use over the course of a game. Players alternate turns as normal, but a game clock keeps track of each player's total used time. Another example of time as a resource are the children's games hot potato and musical chairs. In each of these cases, players struggle not to be "it," whether that means holding the hot potato or being the only one without a chair, when the time is up. Time is an inherently dramatic force when used as a resource. We are all familiar with the tension of a countdown deadline or the anticipation caused by a ticking bomb in an action movie. When used as a resource that players must ration or work against, time can add an emotional aspect to a game design.

3.33   Chess clock

Exercise 3.9: Resource Types

For each of the resource types just described, create a list of your favorite games that use resources of that type. If you can't think of any games that use a particular type of resource, research games that do and play several of them.

These are just some of the resource types that you should think about using when designing your own games. We challenge you to both create your own original types of resources and take resource models from one genre and adapt them to games where they're seldom, if ever, used. You might be surprised with the results.

CONFLICT

Conflict emerges from the players trying to accomplish the goals of the game within its rules and boundaries. As we have already mentioned, conflict is designed into the game by creating rules, procedures, and situations (such as multiplayer competition) that do not allow players to accomplish their goals directly. Instead, the procedures offer fairly inefficient means toward accomplishing the game objective. While inefficient, these means challenge the players by forcing them to employ a particular skill or range of skills. The procedures also create a sense of competition or play, which is enjoyable in some way, so that players will submit themselves to this inefficient system to gain the ultimate sense of achievement that comes from participating.

Here are some examples of things that cause game conflicts to emerge:

- *Pinball:* Keep the ball from escaping the field of play using only the flippers or other devices provided.
- *Golf:* Get the ball from the tee to the hole, past any obstacles on the course, in as few strokes as possible.
- *Monopoly:* Manage your money and your properties to become the richest player in the game.
- *Quake:* Stay alive while player or nonplayer opponents try to kill you.

- *WarCraft III:* Maintain your forces and resources while using them to command and control the map objectives.
- *Poker:* Outbid opponents based on your hand or your ability to bluff.

These examples point to three classic sources of conflict in games: obstacles, opponents, and dilemmas. Let's look at each of these more closely to see what they offer in terms of various types of gameplay.

Obstacles

Obstacles are a common source of conflict in both single and multiplayer games, though they play a more important role in single player games. Obstacles can take a physical form, such as the sack in a sack race, the water on a golf course, or the bumpers on a pinball table. Obstacles can also involve mental skills, such as the puzzles in an adventure game.

Opponents

In multiplayer games, other players are typically the primary source of conflict. In the previous examples, Quake uses other players in addition to nonplayer opponents and physical obstacles to create conflict
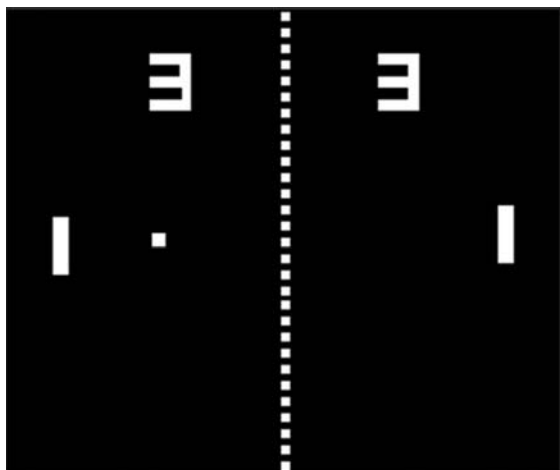
3.34   Pong and Quake III opponents

in the game. Also, Monopoly's conflict comes from interactions with other players.

Dilemmas

As opposed to physical or mental obstacles and conflict from direct competition with other players, another type of game conflict can come from dilemma-based choices that players have to make. An example of a dilemma in Monopoly is the choice of whether to spend money to buy a property or use that money to upgrade a property that is already owned. Another dilemma would be whether to stay in or fold in poker. In both cases, players have to make choices that have good or bad potential consequences. A dilemma can be a powerful source of conflict in both single and multiplayer games.

Exercise 3.10: Conflict

Explain how conflict is created in the following games: Tetris, Frogger, Bomberman, Minesweeper, and solitaire. Does the conflict in these games come from obstacles, opponents, dilemmas, or a combination of these?

Boundaries

Boundaries are what separate the game from everything that is not the game. As discussed on page 32, the act of agreeing to play, to accept the rules of the game, to enter what Huizinga calls the "magic circle," is a critical part of feeling safe that the game is temporary, that it will end, or that you can leave or quit if you don't want to play anymore. As a designer, you must define the boundaries of the game and how players will enter and exit the magic circle. These boundaries can be physical—like the edges of an arena, playing field, or game board—or they can be conceptual, such as a social agreement to play. For example, ten people can be physically sitting in a room where Truth or Dare is being played, but two of them might not have agreed to play and are therefore outside the boundaries of the system.

Why are boundaries an important aspect of game design to consider? Think about what might happen if there were no boundaries in a familiar game system. Imagine a game like football. What if you tried to play football (either in a physical setting or on a computer) without boundaries? Players could run anywhere they wanted to; they could run as far as they could physically get without being tackled by

the other team or blocked by random objects like buildings or cars. What does this do to the strategy of football? What about the abilities necessary for play? Apply this line of thinking to other games you know. Can you see how they would be intrinsically different if their boundaries were not closed? What if you could add real money to the bank in Monopoly? Or if you could add cards to the deck in poker? What if the edges of a chess board were infinitely expanding? It is clear without even playing these games that without their boundaries they would become totally

different games. This is not necessarily a bad thing—an interesting design exercise would be to take a familiar game and change its boundaries to see how it affects the play experience.

In addition to the purely formal aspect for game boundaries, however, there's also an emotional one. The boundaries of the game serve as a way to separate everything that goes on in the game from daily life. So while you might act the part of a cutthroat opponent facing off against your friends within the boundaries of a game (taking over their civilizations or destroying their forces), you can shake hands at the end of the game and walk away without any real damage to your relationships. In fact, you might feel closer to them, having met in this game-world competition.

As a designer, boundaries are another tool we have in crafting the player experience. Some games are very free form and do not require strictly defined boundaries to work. For example, tag is usually played with loosely defined boundaries, but with no detriment to the overall experience. Some modern game designers have begun playing with the idea that interaction with outside elements is an interesting design choice for their systems. An emerging genre of games called alternate reality games (ARGs) use a combination of real-world and online interaction to create their game play.
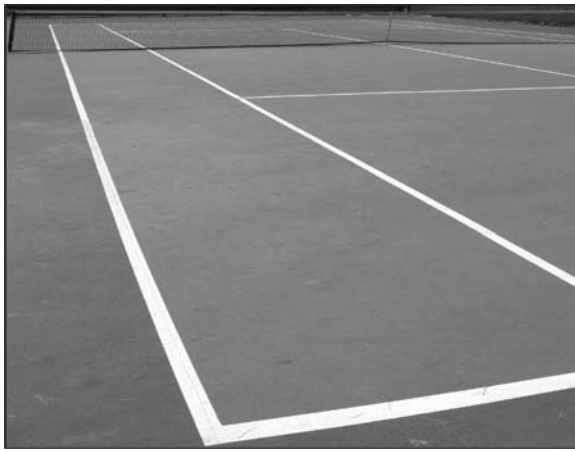
3.35   Boundaries of a tennis court

**3.36   Big Urban Game and PacManhattan—
        Turning cities into game boards**

A good example of this was I Love Bees, an ARG created to promote the release of Halo 2. The game, which was accessed at the Web site www.ilovebees.com, sent players to real world locations to find ringing pay phones where they would receive further information and instructions. Other games that break physical and conceptual boundaries are sometimes called "big games," which are large-scale games that take over public spaces for playful interactions. Games like the Big Urban Game by Frank Lantz, Katie Salen, and Nick Fortugno, or Cruel 2 B Kind by Ian Bogost and Jane McGonigal (see Ian Bogost's sidebar on page 57), are examples of this type of boundary-breaking play.

The ways that these experimental games treat the boundaries of their systems are something of an exception. Most games are typically closed systems. Typically, games clearly define that which is within the game versus that which is outside the game, and they purposefully keep the in-game elements from interacting with outside forces. But it is up to you as the game designer to determine just where and how these boundaries are defined and when, or if, to ever breach them.

Exercise 3.11: Boundaries

What are the boundaries in the tabletop role-playing game Dungeons & Dragons? Can you think of physical and conceptual boundaries?

Outcome

As described previously, the outcome of a game must be uncertain to hold the attention of the players. That uncertainty is generally resolved in a measurable and unequal outcome, though this is not always necessary: Many massively multiplayer online worlds do not have the concept of a winner or even an end state. Also, simulation games might not have a predetermined win condition. These games are built to go on indefinitely and reward players in other fashions than by winning or finishing the game. Though some people might not call these games because they differ from the basic definition, we don't find it useful to remove these powerful experiences from our consideration of games. Rather, we believe that expanding our definition or exploring the border cases makes for a more interesting and useful stance.

For most game systems, however, producing a winner or winners is the end state of a game. At defined intervals either the players (in the case of a nondigital game) or the system check to see if a winning state has been achieved. If it has, the system resolves and the game is over.

There are a number of ways to determine outcome, but the structure of the final outcome will always be related to both the player interaction patterns discussed earlier and the objective. For example, in pattern one, single player versus game, the player might either win or lose, or the player might score a certain amount of points before ultimately losing. Examples of this outcome structure are solitaire, pinball machines, or a number of different arcade games.

In addition to the player interaction patterns described on page 50, the outcome is determined by the nature of the game objective. A game that defines its objective based on points will most certainly use those points in the measure of the outcome. A game that defines its objective as capture, like chess, might not have a scoring system—rather, chess games are won or lost based solely on meeting the primary objective, checkmating the king.

Chess is what we call a "zero-sum" game. By this we mean that if we count a win as +1 and a loss as a −1, then the sum for any outcome is zero. In chess one player wins (+1) and one player loses (−1). No matter which player wins, the sum is always zero.

But many games are not zero-sum games; a non-zero-sum game is one in which the overall gains and losses for the players can be more than or less than zero. Games such as World of Warcraft are not zero-sum because the overall outcome of this complex, ongoing game world is never equal to zero. Cooperative games, such as the Lord of the Rings board game by Reiner Knizia, are also non-zero-sum because a gain by one player does not mean a loss

by the others. Non-zero-sum games often have more subtle gradations of reward and loss than zero-sum games; for example, ranking systems, player statistics, or multiple objectives, all of which can create measurable outcomes without the finite judgment of a zero-sum game.

On page 322 we discuss the way in which non-zero-sum games can create interesting player dilemmas and complex, interdependent risk/reward scenarios that can make for interesting gameplay. Look at the games you play: What types of outcomes are most satisfying? Does that answer change in different situations; for example, social games versus sporting events? When you determine the outcome for a game that you are designing, be sure to keep these types of considerations in mind.

Exercise 3.12: Outcome

Name two zero-sum games and two non-zero-sum games. What is the main difference in the outcomes of these games? How does this affect gameplay?

CONCLUSION

These formal elements, when set in motion, create what we recognize as a game. As we have seen throughout this chapter, there are many possible combinations of these elements that work to create a wide variety of experiences. By understanding how these elements work together and thinking about new ways of combining these elements, you can invent new types of gameplay for your games. A good practice for a beginning game designer is to use these formal elements to analyze games that you play. Use the game journal you began in Chapter 1 to start a record of your analysis of the games you play. This will increase both your understanding of gameplay and your ability to articulate complex game concepts.

Exercise 3.13: Revise Rules and Procedures

The rules and procedures of backgammon are fairly simple. Change them so that they are not dependent on chance. How does this affect the gameplay?

Designer Perspective: Lorne Lanning

President, Creative Director, and Cofounder, Oddworld Inhabitants

Lorne Lanning is a game designer, writer, and animated film director whose game credits include Oddworld: Abe's Oddysee (1997), Oddworld: Abe's Exoddus (1998), Oddworld: Munch's Oddysee (2001), and Oddworld: Stranger's Wrath (2005). Current projects include Citizen Siege: The Animated Motion Picture and Citizen Siege: Wage Wars, an online game.

On the design process:

It's a very abstract process for me that stems from those issues in life that I care passionately about. I also do a lot of research on unrelated topics. Usually the best ideas come from way out of left field, so I spend a lot of time in left field in ways that others might consider off target, but the creative process is one where we marry ideas that didn't previously go together . . . so as a designer I believe it's critical to research beyond the field of your medium. Those that don't and only inherit ideas from their medium tend to have a harder time coming up with something unique and fresh.

On prototypes:

Prototypes are critical. Focus on the most critical components that are going test your project's feasibility and fun factor by investing in prototypes up front. The last thing you want is a team working on something that they don't believe can be done, so this prototype stage not only benefits the learning curve, but also a team's morale.

On game influences:

- *Flashback/Out of This World/Prince of Persia:* I felt that all of these platform games brought a new degree of drama and life to game design. Realistic animations combined with an interesting story, continued cut scenes, and story-oriented puzzle mechanics inspired the first Oddworld games on the PlayStation. These games were gleaming light posts, indicating that one day films and games would have more in common than previously imagined.
- *Terminator 2 (arcade):* I saw this arcade game at a theme park convention before it was released to the public (it was also before I was in the game design business). When I saw this game, it became quite evident how the future of content would be in amortized digital databases across various delivery mediums. This was the first game that successfully used actual film production assets in the game. It was a signpost for me that read, "This way lies the future of universe oriented digital multimedia properties."

- *WarCraft II*: This game really brought home the joy that could be experienced when managing a large group of agents that you have birthed and nurtured over time. This also revealed a huge psychological component to me that emerged via absolute control over their fate. Certainly, other games had touched upon this, but WarCraft II enabled a smooth, simple control/management interface that allowed the positive emotional reaction to the experience to unfold without frustrating tedium. It also installed a sweet, simple blend of sim and strategy that was previously lacking in real time war games.

- *Super Mario 64*: Though it is very challenging to stay interested in the content (admittedly, it is for kids), the analog controls mixed with analog animations brought the interactive 3D character to new levels of life and fluidity. It always amazes me how people will tolerate stiff and digital controls, sometimes even preferring them. For me, I can't play games that suggest they are dealing with living life forms yet have stiff or digital feeling controls that result in robotic looking/feeling characters. It's always a huge turnoff that keeps me from enjoying what might be a good game. On this front, Mario set the stage for what constitutes great 3D analog character controls.

- *The Sims*: This game is a record holder when it comes to innovation as well as an amazing example of a developer's ability to nurture and support a mod community that will, in return, nurture and support the shelf life of a product. This is a product that is beyond the norm of traditional genres. This is a game that, if focus tested with the usual suspects in the community, could likely have faced being cut while still in development. However, this series stands tall when it comes to proving that games are not always what we (in the biz) think they should be, while also proving that there is a tremendous market of potential players that are just plain uninterested in what the rest of the industry has to offer them. In many ways, this series is a great white hope for the future of innovation in game design, not necessarily in terms of the game design structure and chemistry, but more importantly in how different this game is from the rest of the herd.

- *Tamagotchi*: Much like The Sims, I know there is an entire breed of games that have yet to be created that will take the concept of nurturing virtual life forms to entirely new levels. When games' sociological effects can force a major corporation, like Japan Airlines, to change a policy in response to screaming children that are delaying takeoff (because they were told they needed to turn off all their electrical devices), then you're witnessing something much deeper than people just being addicted to challenging games. We're now watching humans experience new levels of emotional attachment and codependency on virtual life forms.

Advice to designers:

Beyond having an extremely strong work ethic, beyond looking at and studying all the games that you can learn from, beyond being educated and brilliant in programming, design, computer animation, writing, whichever is your skill set, you need to look at and study the life outside of games that is all around you. The best ideas will not come from other games. The best ideas will come from areas that have nothing to do with games. They will come from other areas, art forms and sciences like sociology, agriculture, philosophy, zoology, or psychology. The more you find inspirational sources that come from areas beyond the spectrum of your intended medium, the more unique your creations will feel to others.

Designer Perspective: Marc LeBlanc

Technical Director, Senior Designer, Mind Control Software

Marc LeBlanc is a game designer, programmer, and project leader with 14 years of experience in the game industry. His game credits include Ultima Underword II (1993), System Shock (1994), Thief: The Dark Project (1998), System Shock 2 (1999), Thief 2: The Metal Age (2000), Oasis (2004), and Arrrrr! (2007).

On getting into the game industry:

When I went to school at MIT, I lived on 41st West, a dormitory hall that was home to a number of quirky individuals. Around 1990, several of my 41st West friends (including Dan Schmidt, Jon Maiara, James Fleming, Tim Stellmach, and the ubiquitous Doug Church) joined with Paul Neurath to form Blue Sky Productions. They were working on a game called Underworld. The game later became Ultima Underworld, and the company later became Looking Glass Studios. I joined in 1992, and the rest is history.

On favorite games:

- *X-Com*: *UFO Defense*: Now a classic, this game took two smaller games—strategic resource management and tactical combat—and married them perfectly. X-Com is a textbook example of emergent narrative. Through the simplest tricks, it gets the player's imagination to connect the narrative dots between the characters and events of the game. Suit up, son! You're going to Mars!
- *Pikmin*: Real time strategy games have always had the wrong user interface for the job. Skilled players have to master complicated finger acrobatics until they become keyboard virtuosos. Pikmin does away with all that, creating the first real time strategy game to truly embrace its "twitchiness." Brilliant!
- *Star Control II*: This game had mixed authored storylines with some simple real time tricks to create a narrative that was both well written and compellingly organic in a way that has yet to be duplicated. Combine that with twitchy combat that is the worthy heir to Space War, and you have a classic.

On game influences:

- *Sid Meier's SimGolf*: This game should be mandatory for all game designers. Don't be fooled by the golf theme; this game is a tutorial in level design.
- The board games of Reiner Knizia, particularly Modern Art and Tigris & Euphrates. If you ever find yourself wishing you had faster hardware or more RAM, remember what this guy can do with ten pages of rules and a few slabs of cardboard.
- *Grand Theft Auto III*: While I'm not necessarily a fan of the subject matter, it was heartening to see this kind of open-ended gameplay capture the mainstream console audience.

Advice to designers:

- Have a critical eye for games. If you can't say one critical thing about any game, even your *favorite* game, then you're an amateur.
- Learn to program. Designing a game without know how to program is like painting without a brush.
- *Play lots of games. Play games in every medium*: PC, console, board games, party games, and sports. Play the classics. Play Go.
- Remember that if you're lucky, your game will get played by millions of people. Design the game for them, not for you.

Further Reading

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Chapter 4
Working with Dramatic Elements

Exercise 4.1: Making Checkers Dramatic

The game of checkers is very abstract: There is no story, no characters, and no compelling reason why you would want to capture all of your opponent's pieces, except for the fact that it's the objective of the game. For this exercise, devise a set of dramatic elements for checkers that make the game more emotionally engaging. For example, you might create a backstory, give each piece its own name and distinctive look, define special areas on the board, or whatever creative ideas you can think of to connect the players to this simple, abstract system. Now play your new game with friends or family and note their reactions. How do the dramatic elements improve or detract from the experience?

We have seen how formal elements work together to create the experience we recognize as a game, but now let's turn to those elements that engage the players emotionally with the game experience and invest them in its outcome—the dramatic elements of games. Dramatic elements give context to gameplay, overlaying and integrating the formal elements of the system into a meaningful experience. Basic dramatic elements, like challenge and play, are found in all games. More complicated dramatic techniques, like premise, character, and story, are used in many games to explain and enhance the more abstract elements of the formal system, creating a deeper sense of connection for the players and enriching their overall experiences.

One way to create more engaging games is to study how these elements work to create engagement and how they've been used in other games—as well as other media. Your exploration of these dramatic elements and traditional tools can help you think of new ideas and new situations for your own designs.

Exercise 4.2: Dramatic Games

Name five games that you find dramatically interesting. What is it about those games that you find compelling?

Challenge

Most people would agree that one thing that engages them in a game is challenge. What do they really mean by challenge, though? They don't simply mean that they want to be faced with a task that is hard to accomplish. If that were true, the challenge of games would hold little difference from the challenges of everyday life. When players talk of challenge in games, they're speaking of tasks that are satisfying to complete, that require just the right amount of work to create a sense of accomplishment and enjoyment.

Because of this, challenge is very individualized and is determined by the abilities of the specific player in relationship to the game. A young player

who is just learning to count might find a game of Chutes and Ladders particularly challenging, while an adult who mastered that skill long ago would probably find it boring.

In addition to being individualized, challenge is also dynamic. A player might find one task challenging at the beginning of a game, but after becoming accomplished in the task, they'll no longer find it challenging. So the game must adapt to remain challenging and hold the interest of the more accomplished player.

Is there a way to look at challenge that is not defined by individual experience? One that can give us some general ideas to keep in mind when designing a game? When you set out to create the basic challenge in your game, you might start by thinking how people really enjoy themselves and which types of activities make them happy. As it turns out, the answer to this question is directly related to the concept of challenge and the level of challenge presented by an experience.

The psychologist Mihaly Csikszentmihalyi set out to identify the elements of enjoyment by studying similarities of experience across many different tasks and types of people. What he found was surprising: Regardless of age, social class, or gender, the people he talked to described enjoyable activities in much the same way. The activities themselves spanned many different disciplines, including performing music, climbing rocks, painting, and playing games, but the words and concepts people used to describe their enjoyment of them were similar. In all these tasks, people mentioned certain conditions that made the activities pleasurable for them:

First, the experience (of enjoyment) usually occurs when we confront tasks we have a chance of completing. Second, we must be able to concentrate on what we are doing. Third and fourth, the concentration is usually possible because the task undertaken has clear goals and provides immediate feedback. Fifth, one acts with a deep but effortless involvement that removes from awareness the worries and frustrations of everyday life. Sixth, enjoyable

experiences allow people to exercise a sense of control over their actions. Seventh, concern for the self disappears, yet paradoxically the sense of self emerges stronger after the flow experience is over. Finally, the sense of the duration of time is altered; hours pass by in minutes, and minutes can stretch out to seem like hours. The combination of all these elements causes a sense of deep enjoyment that is so rewarding people feel like expending a great deal of energy is worthwhile simply to be able to feel it.[1]

Based on his findings, Csikszentmihalyi created a theory called "flow" that is illustrated in Figure 4.1. When a person begins performing an activity, they usually have a low level of ability. If the challenge of the activity is too high, they will become frustrated. As they continue on, their ability rises, however, and if the challenge level stays the same, they will become bored. Figure 4.1 shows a path of rising challenge and ability balanced carefully between frustration and boredom, which would result in an optimal experience for a user.

If the level of challenge remains appropriate to the level of ability, and if this challenge rises as the ability level rises, the person will stay in the center region and experience a state that Csikszentmihalyi calls "flow." In flow, an activity balances a person
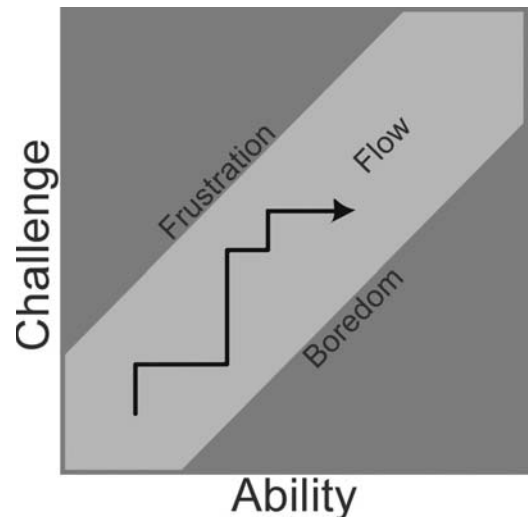
4.1   Flow diagram

between challenge and ability, frustration and boredom, to produce an experience of achievement and happiness. This concept is very interesting for game designers because this balance between challenge and ability is exactly what we are trying to achieve with gameplay. Let's look more closely at the elements that help to achieve flow.

A Challenging Activity That Requires Skill

According to Csikszentmihalyi, flow occurs most often within activities that are "goal-directed and bounded by rules . . . that could not be done without the proper skills."[2] Skills might be physical, mental, social, etc. For a person who does not have any of the skills a task requires, it is frustrating and meaningless. For a person who has the skills but is not completely assured of the outcome, a task is challenging. This is particularly important to game design.

Exercise 4.3: Skills

List the types of skills required by the games you enjoy. What other types of skills do people enjoy that you could incorporate into the games you design?

The Merging of Action and Awareness

"When all of a person's relevant skills are needed to cope with the challenges of a situation, that person's attention is completely absorbed by the activity," Csikszentmihalyi goes on to say. "People become so involved in what they're doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing."[3]

Clear Goals and Feedback

In everyday life, there are often contradictory demands on us; our goals are not always clearly defined. But in flow experiences, we know what needs to be done, and we get immediate feedback on how well we're achieving our goals. For example, musicians know what notes to play next and can hear when they make mistakes; the same is true whether it's playing tennis or rock climbing. When a game has clearly defined goals, the players know what needs to be done to win, to move to the next level, to achieve the next step in their strategy, etc., and they receive direct feedback for their actions toward those goals.

4.2   An activity that requires skill: Tony Hawk's Pro Skater

4.3   Merging action and awareness: Metal Gear Solid 3
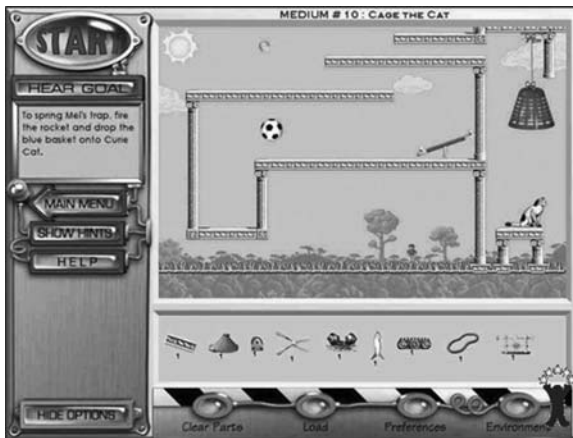
4.4   Clear goals and feedback: Incredible Machine: Even More Contraptions

Exercise 4.4: Goals and Feedback

Pick three games and list the types of feedback generated in each. Then describe how the feedback relates to the ultimate goal of each game.

Concentration on the Task at Hand

Another typical element of flow is that we are aware only of what's relevant here and now. If a musician thinks of his health or tax problems when playing, he is likely to hit a wrong note. If a surgeon's mind wanders during an operation, the patient's life is in danger. In game flow, the players are not thinking of what is on television or how much laundry they have to do; they are focused entirely on the challenges presented in the game. Many game interfaces take over the entire screen of the PC or build impressive audiovisual worlds to focus our attention. Here is a quote from a mountaineer describing a flow experience (but these might as well be the words of an EverQuest player): "You're not aware of other problematic life situations. It becomes a world unto its own, significant only to itself. It's a concentration thing. Once you're in the situation, it's incredibly real, and you're very much in charge of it. It becomes your total world."[4]

4.5   Concentration on the task: Asteroids

4.6   Paradox of control: Civilization III

The Paradox of Control

People enjoy the sense of exercising control in difficult situations; however, it is not possible to experience a feeling of control unless the outcome is unsure, meaning that the person is not actually in complete control. As Csikszentmihalyi says, "Only when a doubtful outcome is at stake, and one is able to influence that outcome, can a person really know she is in control."[5] This "paradox of control" is a key element of the enjoyment of game systems. How to offer meaningful choices to players, without offering complete control or an assured outcome, is a subject we will return to many times throughout this book.

The Loss of Self-Consciousness

In everyday life, we are always monitoring how we appear to other people and protecting our self-esteem. In flow we are too involved in what we're doing to care about protecting the ego. "There is no room for self-scrutiny. Because enjoyable activities have clear goals, stable rules, and challenges well matched to skills, there is little opportunity for the self to be threatened."[6] Although the flow experience is so engrossing that we forget our self-consciousness while we are engaged in it, after a flow activity is over, we generally emerge with a stronger self-concept. We know that we have succeeded in meeting a difficult challenge. So, for example, the musician feels at one with the harmony of the cosmos; the athlete moves at one with the team; the game player feels empowered by the efficacy of her strategies. Paradoxically, the self expands through acts of self-forgetfulness.

4.7   Loss of self-consciousness: Dance Dance Revolution

The Transformation of Time

"One of the most common descriptions of optimal experience is that time no longer seems to pass the way it ordinarily does," says Csikszentmihalyi. "Often hours seem to pass by in minutes; in general, most people report that time seems to pass much faster. But occasionally the reverse occurs: Ballet dancers describe how a difficult turn that takes less than a second in real time stretches out for what seems like minutes."[7] Digital games are notorious for sucking players in for hours on end because they involve players in flow experiences that distort the passage of time.

Experience Becomes an End in Itself

When most of these conditions are present, we begin to enjoy whatever it is that produces such an experience, and the activity becomes autotelic, which is Greek for something that is an end in itself. Most things in life are exotelic. We do them not because we enjoy them but to achieve some goal. Some activities such as art, music, sports, and games are usually autotelic: There is no reason for doing them except to enjoy the experience they provide.

These elements of enjoyment are not a step-by-step guide to creating enjoyable, challenging game experiences; you need to work out for yourself what these ideas mean in the context of your own games. But the focus that Csikszentmihalyi places on goal-oriented, rule-driven activities with clear focus and feedback are clues that might point you in a beneficial direction.

Think about questions like these as you design your game:

- What skills does your target audience have? What skill level are they at? Within that knowledge, how can you best balance your game for your players' abilities?
- How can you give your players clear, focused goals, meaningful choices, and discernible feedback?
- How can you merge what a player is doing physically with what they need to be thinking about in the game?
- How can you eliminate distractions and fear of failure; that is, how can you create a safe

4.8 Transformation of time: Dark Age of Camelot

environment where players lose their sense of self-consciousness and focus only on the tasks at hand?

- How can you make the game activity enjoyable as an end in itself?

Answering these questions is a good first step toward creating an environment where challenge becomes a central attraction rather than a feature that is too off-putting, or too simplistic, to engage players' emotions.

PLAY

The potential for play is another key dramatic element that engages players emotionally in games. As discussed in Chapter 2, play can be thought of as freedom of movement within a more rigid structure. In the case of games, the constraints of the rules and procedures are the rigid structure, and the play within that structure is the freedom of players to act within those rules—the opportunity for emergent experience and personal expression.

The Nature of Play

The Promise of Play, a documentary film investigating the subject, queried a number of people about the nature of play. Here are some of their responses: "Play is boisterous." "It's non-directed." "It's spontaneous." "It's not scripted." "Play is loud." "Not work." "It's physical." "It's fun." "An emotional state when you're having a good time." "Play actually is meaningless behavior. You do it for its intrinsic value to you, but play can have utility. That is, you end up developing skills, and those skills can then be used in other arenas." "I think play is one of the ways that we get a feel for the shape of the world." "Play is the central item in children's lives. It's like work is to grown-ups. They play to learn." "Play is child's work. It's all that young children do to learn about the world that they're in."[8]

It's clear from these responses that play has many faces: It helps us learn skills and acquire knowledge, it lets us socialize, it assists us in problem solving, it allows us to relax, and it makes us see things differently. Play is not too serious; it induces laughter and fun, which is good for our health. On the other hand, play can be somewhat serious: Play as a process of experimentation—pushing boundaries and trying new things—is an area of common ground for artists and scientists, as

	Free-form play *(paida)*	Rule-based play *(ludus)*
Competitive play *(agôn)*	Unregulated athletics (foot racing, wrestling)	Boxing, billiards, fencing, checkers, football, chess
Chance-based play *(alea)*	Counting-out rhymes	Betting, roulette, lotteries
Make-believe play *(mimicry)*	Children's initiations, masks, disguises	Theater, spectacles in general
Vertigo play *(ilinx)*	Children "whirling," horseback riding, waltzing	Skiing, mountain climbing, tightrope walking

4.9   Examples taken from *Man, Play and Games* (diagram based on Rules of Play by Salen and Zimmerman)

well as children. In fact it is one of the few areas where children are seen as experts with something to teach adults. Play is recognized as a way of achieving innovation and creativity because it helps us see things differently or achieve unexpected results. The one thing that stands out from these meditations on play is that play is not any one thing but rather a type of approach to an activity. A playful approach can be applied to even the most serious or difficult subjects because playfulness is a state of mind rather than an action.

Play theorist Brian Sutton-Smith, in his book *The Ambiguity of Play*, describes a number of activities that could be considered play, including: mind play like daydreaming; solitary play such as collection or handicrafts; social play such as joking around or dancing; performance play such as playing music or acting; contest play such as board games or video games; and risky play such as hang gliding or extreme sports.[9] Playful activities such as these were categorized by sociologist Roger Callois in his 1958 book *Man, Play and Games* into four fundamental types of play:

- Competitive play, or *agôn*
- Chance-based play, or *alea*
- Make-believe play, or *mimicry*
- Vertigo play, or *ilinx*

Callois modifies these categories further with the concepts of *ludus*, or rule-based play, and *paida*, or free-form, improvisational play. Figure 4.9 shows examples of types of play within each of these categories. What is interesting for game designers about this classification system is that it allows us to talk specifically about some of the key pleasures of the types of play associated with different types of game systems. For example, strategy games like chess or Warcraft III are clearly competitive, rule-based play, while role-playing games involve both mimicry and competition in a rule-based environment. Examining the pleasures of each of these types of play can help you determine player experience goals for your game system.

Types of Players

After categorizing play itself, we can also identify the various types of players, each of whom comes to a game with different needs and agendas. Similar to the basic player types described by Richard Bartle in Chapter 3 on page 51, these categories address the pleasures of play from the point of view of the player.[10]

- *The Competitor:* Plays to best other players, regardless of the game
- *The Explorer:* Curious about the world, loves to go adventuring; seeks outside boundaries—physical or mental
- *The Collector:* Acquires items, trophies, or knowledge; likes to create sets, organize history, etc.
- *The Achiever:* Plays for varying levels of achievement; ladders and levels incentivize the achiever
- *The Joker:* Doesn't take the game seriously—plays for the fun of playing; there's a potential for jokers to annoy serious players, but on the other hand, jokers can make the game more social than competitive
- *The Artist:* Driven by creativity, creation, design
- *The Director:* Loves to be in charge, direct the play
- *The Storyteller:* Loves to create or live in worlds of fantasy and imagination
- *The Performer:* Loves to put on a show for others
- *The Craftsman:* Wants to build, craft, engineer, or puzzle things out

This list is not exhaustive, and not all of these types of players have been equally addressed by today's digital games, meaning that they offer an interesting area of study for the game designer looking for new areas of play with which to emotionally engage players.

Exercise 4.5: Player Types

For each player type described above, list a game you know that appeals to that variety of player. What type of player do you tend to be?

Levels of Engagement

In addition to thinking about categories of play and types of players, the level of engagement can also vary; not all players need to participate at the same level to find the same enjoyment. For example, spectators might find watching sports, games, or other events more satisfying than playing them. We don't tend to think of designing games for spectators, but the truth is, many people enjoy games in this way. How many times have you sat and watched a friend make their way through the level of a console game, waiting for your turn at the controls? Is there a way as a designer to take this spectator mode into account when designing the play?

Participant play is, of course, the most common way to think about play. As opposed to spectator play, where risk is minimal, participant play is active and involved. It is also the most directly rewarding for all the reasons we've already talked about. Sometimes participants experience transformational play: This is a deep level of play that actually shapes and alters the

4.10   Peacemaker

player's life. Children experience this level when they learn life lessons through play; in fact, it is one of the reasons they engage in play naturally.

Some games in the emerging genre of serious games attempt to access this level of transformational play as a key goal of their player experience. For example, the game Peacemaker, in which players take on the role of a leader trying to bring peace to the Middle East, is an example of a game that attempts to educate players through direct experience with the intricate problems involved in that real-world situation.

It is an interesting area to think about if games are to advance as an art form. Certainly other forms of art inspire transformation and deep learning through their experience. Perhaps finding ways to create this level of play can raise the bar for games as an art form as well.

Premise

In addition to challenge and play, games also use several traditional elements of drama to create player engagement with their formal systems. One of the most basic is the concept of premise, which establishes the action of the game within a setting or metaphor. Without a dramatic premise, many games would be too abstract for players to become emotionally invested in their outcome.

Imagine playing a game in which you are a set of data. Your objective is to change your data to increase its values. To do this, you engage other sets of data according to complex interaction algorithms. If your data wins the analysis, you win. This all sounds pretty intangible and rather boring, but it is a description of how a typical combat system might work from a formal perspective. To connect players to the game

emotionally, the game designer creates a dramatic premise for the interaction that overlays the formal system. In the previous example, let's imagine you play a dwarf named Gregor rather than a set of data. You engage an evil wizard, rather than an opposing set of data, and you attack him with your broadsword, rather than initiating that complex interaction algorithm. Suddenly, the interaction between these two sets of data takes on a dramatic context over and above its formal aspects.

In traditional drama, premise is established in the exposition of a story. Exposition sets up the time and place, characters and relationships, the prevailing status quo, etc. Other important elements of story that can be addressed in the exposition are the problem, which is the event that upsets the status quo and creates the conflict; and the point of attack, which is the point at which the problem is introduced and the plot begins. While there is not a direct one-to-one relationship, these last two elements of exposition are mirrored in our definition of formal game elements by the concepts of objective and starting action discussed in the previous chapter.

To better understand premise, let's look at some examples from well-known stories from films and books rather than games:

In *Star Wars: Episode IV*, the story is set in a far away galaxy. The protagonist, Luke Skywalker, is a young man who wants to get away from his uncle's remote farm and join the interstellar rebellion, but responsibility and loyalty hold him back. The story begins when his uncle buys two droids carrying secret information that is critical to the rebellion.

In *The Fellowship of the Ring*, the story is set in Middle-earth, a fantasy world of strange races and characters. The protagonist, Frodo Baggins, is a young hobbit who is happy right where he is—at home. The story begins when Frodo inherits a ring from his uncle, which turns out to be a powerful artifact, the existence of which threatens the safety of all of Middle-earth.

In *Die Hard*, the story is set in a modern office tower in downtown Los Angeles. The protagonist, John McClane, is an off-duty New York City police officer who is in the building trying to make amends with his estranged wife. The story begins when the building is taken over by terrorists and McClane's wife is taken hostage.

These are each examples of how premise is defined in traditional stories. As can be seen, the premise sets the time and place, the main character(s) and the objective, as well as the action that propels the story forward.

Now let's look at examples of premise from games that you might have played. In a game, the premise might be as complex as those previously mentioned, involving characters with dramatic motivations, or a game's premise can simply be a metaphor overlaying what would otherwise be an abstract system.

First, here is a very simple game premise: in Space Invaders, the game is set on a planet, presumably Earth, which is attacked by aliens. You play an anonymous protagonist responsible for defending the planet from the invaders. The story begins when the first shot is fired. Clearly this premise

4.11   Space Invaders

has none of the richness that we see in the earlier stories. It does, however, have a simplicity and effectiveness that made it very powerful as a game premise. No player needed to read the backstory of Space Invaders to feel the tension of the steadily approaching aliens.

Now, let's look at some games that have attempted to create somewhat more developed premises. In Pitfall, the game is set in the "deep recesses of a forbidden jungle."[11] You play Pitfall Harry, a "world famous jungle explorer and fortune hunter extraordinaire." Your goal is to explore the jungle and find hidden treasures while surviving various hazards like holes, logs, crocodiles, quicksand, etc. The story begins when you enter the jungle.

In Diablo, you play a wandering warrior who arrives in the town of Tristram, which has been ravaged by Diablo. The townspeople ask for your help in defeating Diablo and his undead army, which is ensconced in the dungeon beneath the church. The story begins when you accept the quest.

In Myst, the game is set on a strangely deserted island filled with arcane mechanical artifacts and puzzles. You play an anonymous protagonist with no knowledge of Myst Island or its inhabitants. The story begins when you meet Sirrus and Achenar, two brothers trapped in magical books in the island's library. The brothers, who accuse each other of betrayal, each need you to find some missing pages of their books to help them escape, but both warn you not to help the other brother.

Exercise 4.6: Premise

Write out the premise for five games that you've played and describe how this premise enhances the game.

The first task of a premise is to make a game's formal system playable for the user. Rather than shooting at abstract blocks on a screen, players shoot at aliens in Space Invaders. Rather than searching for a generic resource worth 5000 points, players look for diamond rings in Pitfall. Beyond simply concretizing abstract system concepts and making the game playable, a well thought-out premise can also create a game that appeals to players emotionally.

For example, the premise of Myst not only sends the player on a quest to find the missing pages of one or both of the brothers' magical books, but it also implies that the brothers are not to be trusted and one or both of them might be duping the player. This makes the experience richer for the player, who must determine, by clues found in each age, which, if either, brother to help.

Creating a premise that unifies the formal and dramatic elements is another opportunity for the game

4.12   Pitfall and Diablo
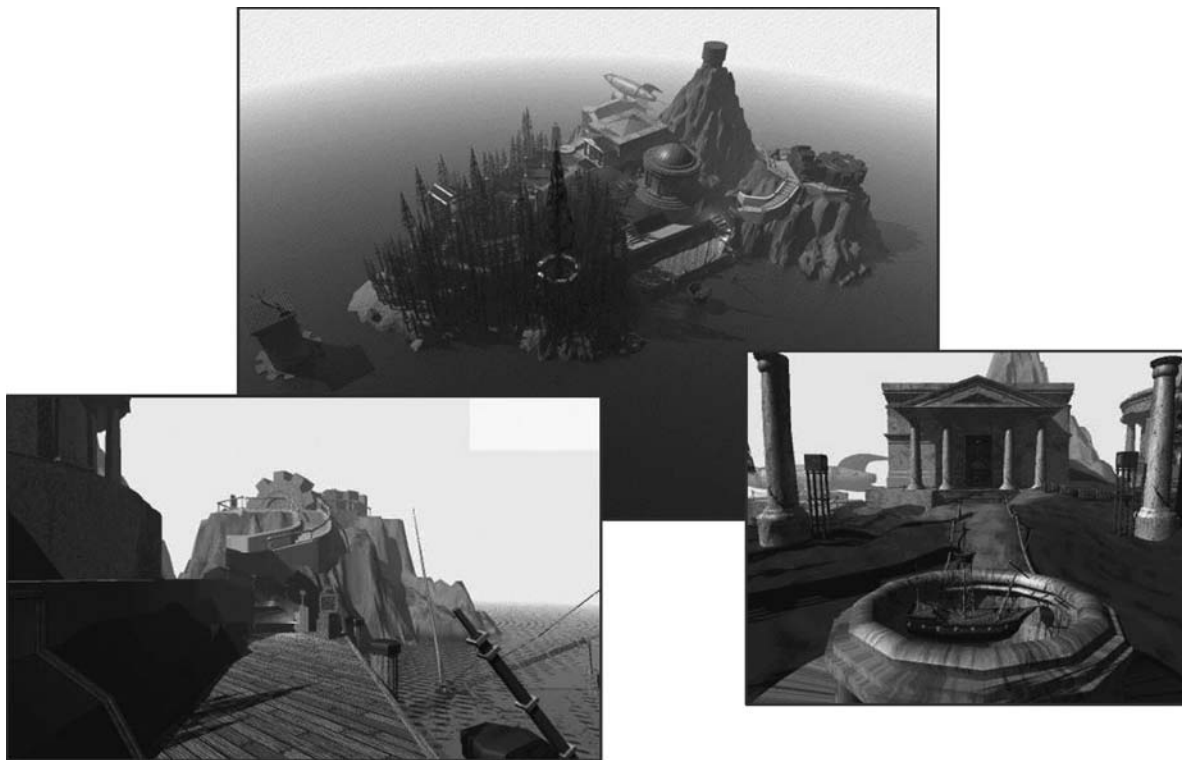
4.13 Myst

designer to heighten the experience of players. As digital games have evolved, more and more designers have begun to make use of elaborate premises in their designs, which, as we'll see, have evolved to the point where they can be considered to be fully realized stories.
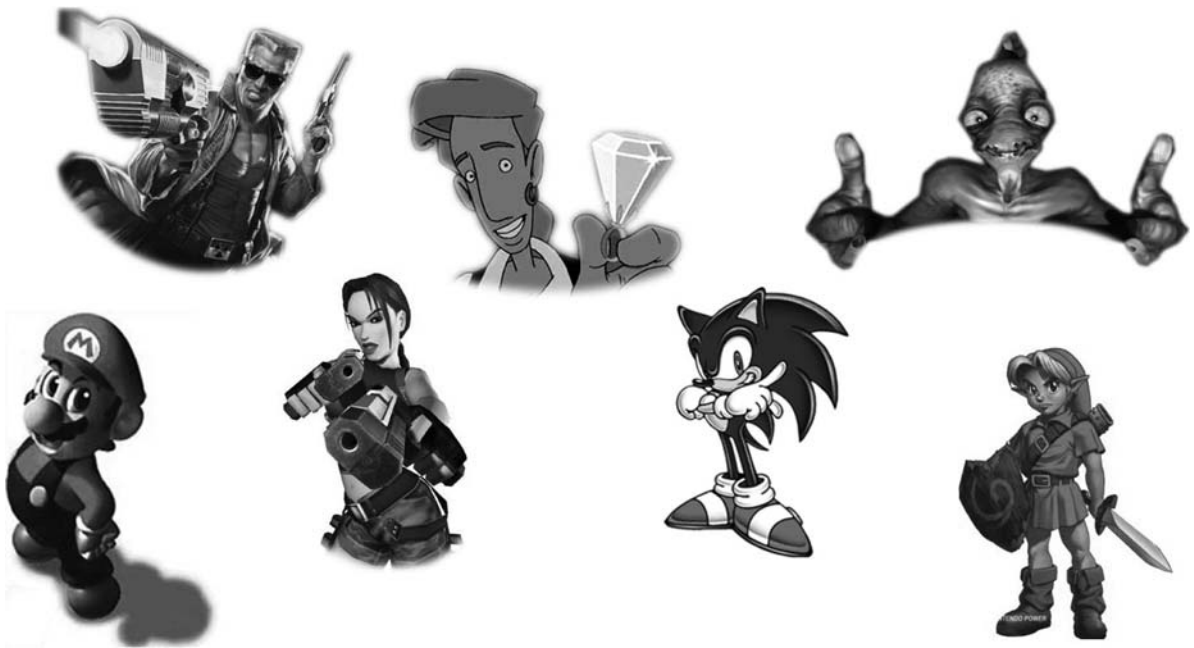
Character

Characters are the agents through whose actions a drama is told. By identifying with a character and the outcome of their goals, the audience internalizes the story's events and empathizes with its movement toward resolution.

There are several ways to understand fictional characters in stories. The first, and probably most common, is psychological—the character as a mirror for the audience's fears and desires. However, characters can also be symbolic, standing for larger ideas such as Christianity, the American dream, democratic ideals, etc. Or they can be representative: standing for a segment of people, such as socioeconomic or ethnic groups, a group with a specific gender, etc. Characters can also be historic, depicting real-world figures. How characters are used in a story depends greatly on the type of story being told. An action adventure story might deal only with stereotypical characters who represent certain cultural clichés. Or perhaps it is an action story told as a metaphor or allegory. Perhaps the main character of this action story is symbolic of a larger idea, like truth, justice, and the American way.

The main character of a story is also called the protagonist. The protagonist's engagement with the problem creates the conflict that drives the story. Working against the main character is the antagonist,

4.14   Digital game characters (clockwise from top left): Duke Nukem, Guybrush Threepwood, Munch, Link, Sonic the Hedgehog, Lara Croft, and Mario

Guybrush Threepwood image courtesy of LucasArts, a division of Lucasfilm Entertainment Company Ltd.

who opposes the main character's attempts to solve the problem. The antagonist can be a person or some other force that works against the main character. Characters can be major or minor—major characters have a significant impact on the story's outcome, while minor characters have a small impact.

Characters are defined within the story by what they say, what they do, what they look like, or what others say about them. These are called methods of characterization. In addition to function and impact on the story, characters can vary in the complexity of their characterization. If a character has well-defined traits and a realistic personality or undergoes a significant change in personality during the story, they can be thought of as a "round" character. Examples of round characters would be Humphrey Bogart's Rick Blaine from *Casablanca*, Hamlet, or Scarlet O'Hara from *Gone with the Wind*. Characters who have few (if any) defined traits and a shallow personality are considered to be "flat." Flat characters show little or no

change in personality, and they are often used as foils to show off the elements of another character. They are also usually recognizable as stereotypes: the lazy guard, the evil stepmother, the jolly doorman, etc.

No matter what level of complexity a character is written with, the there are four key questions to ask when writing to make sure you have really thought through the character's presence in your story:

- What does the character want?
- What does the character need?
- What does the audience/player hope?
- What does the audience/player fear?

These questions are applicable to game characters as well as characters in traditional media. In fact, game characters have many of the same characteristics and functions as traditional characters, and they are often created using the same techniques of characterization.

Game characters also have some unique considerations. The most important of these is the balance between "agency" and "empathy." Agency is the practical function of a character to serve as a representation of the player in the game. Agency can be completely utilitarian, or it can include aspects of creativity, role-playing and identification. Empathy is the potential for players to develop an emotional attachment to the character, to identify with their goals and, consequentially, the game objectives.

Agency and empathy must be considered at every level of the game design that involves characters. For example, are characters predesigned? Do they have an existing backstory and motivations? Or are they player-created characters? Do they allow customization and growth? Early game characters were completely defined by how they looked, with little or no attempt at characterization. Mario, in his first appearance in Donkey Kong, was defined by his funny nose and signature cap and overalls. While his motivation, rescuing Pauline, was integrated into both the formal and dramatic aspects of the game, he was ultimately a flat, static character who did not change or grow over the course of the game. More importantly, Mario would not do anything to accomplish his goal without the player's control.
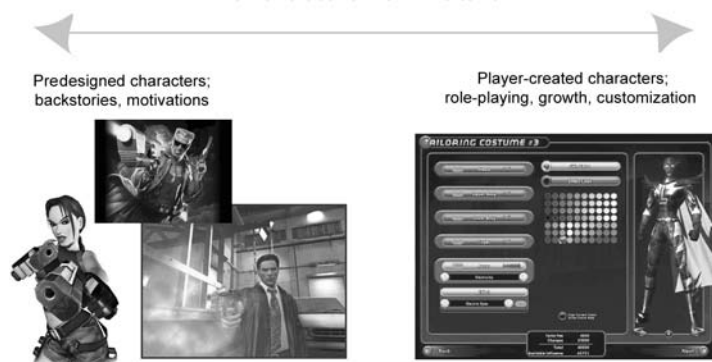
Today many game characters have deep backstories and rich characterizations that affect the player's experience of the game. For example, Kratos, the main character of God of War, is a Spartan general who is sent to kill the god Ares. His duty is intertwined with fate, and as the game progresses, we discover his motivation to be much deeper than a simple order; he blames Ares for the death of his family, and this mission is one of revenge. Another example is Wander, the protagonist of Shadow of the Colossus. Wander is motivated by his desire to resurrect Mono, a girl who has been sacrificed. We don't know much about the relationship between Wander and Mono or much about Wander himself. But his character is rounded by his actions and demeanor, and the changes that take place in him over the course of the game as he gradually transforms into the form of his own enemy, the Colossi he has been ordered to destroy.

Avatars, however, in games like World of Warcraft or City of Heroes, are player created, often with great investment of time and money. Player-created characters have as great a potential for empathy (if not more) as story-driven characters. The question is not which method is better but which is best for your game's design and player experience goals.

Another question for the designer in the creation of game characters is in regards to "free will" versus player control. Game characters that are controlled by the player do not always have the opportunity to act on their own. The player is assuming agency for the character's actions, which limits the degree to which characters can demonstrate their own personality and inner thought process. But sometimes game characters are not entirely in the control of the player. Sometimes the character is controlled by artificial intelligence (AI). AI-controlled characters
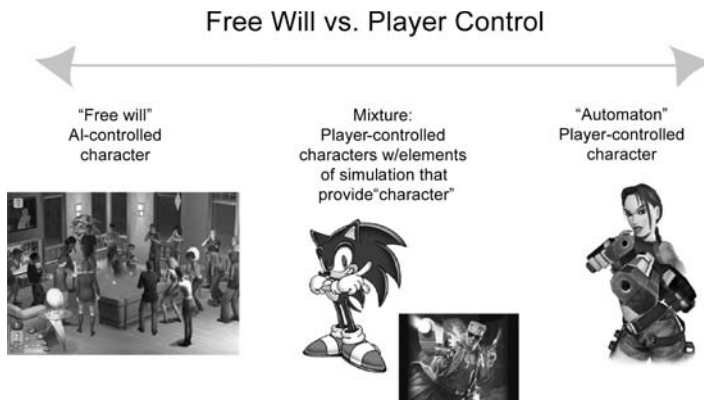

Characters vs. Avatars

Predesigned characters; backstories, motivations

Player-created characters; role-playing, growth, customization

4.15   Characters versus avatars

4.16   God of War II and Shadow of the Colossus

4.17   Free will versus player control

exhibit a sense of autonomy that creates an interesting potential tension between what the player wants and what the character wants.

An early, primitive version of this autonomy is the character of Sonic the Hedgehog—Sega's answer to Mario. If the player stopped interacting with Sonic, the little hedgehog let the player know of his dissatisfaction by crossing his arms and tapping his feet impatiently. Impatience was central to Sonic's character: He did everything fast and had no time to spare. Unlike the blazingly fast actions controlled

by the player, however, the toe-tapping routine was Sonic's own, and it established him as a unique character.

Of course, Sonic's toe tapping had no impact on gameplay, but the tension between player-controlled action and character-controlled action is an interesting area that has been explored to great effect more recently in games like The Sims, Oddworld: Munch's Oddysee, and Black & White. If the free will feature is turned on in The Sims, characters will decide on their own course of action (assuming the player

hasn't given them anything specific to do). Players can stop a character from performing an action at any time, but with this feature on, the game usually unfolds as a complicated dance between what the player desires and what the character "wishes." This sophisticated model produces dramatic results that the player feels both responsible for and yet surprised by.

Believable AI for characters like The Sims is a holy grail of game design these days both for player-controlled characters and nonplayer characters. Believable enemy and nonplayer characters in action games can make for more exciting, replayable game levels. For example, both the enemies and the nonplayer allies in the Halo series have a sophisticated AI that tracks their knowledge of the area (how many enemies are around, etc.) and their fear. If they are outnumbered and afraid, they might run away. Experimental games like Michael Mateas and Andrew Stern's Façade are breaking new ground not only in terms of believable character AI, but also believable story AI. In Façade, the main characters, Grace and Trip, invite you (the player) over for dinner. What happens at this fated dinner party is generated procedurally based on a unique "story beat" AI, the character AI, and the player input.

In general, game characters are evolving to become more rounded, dynamic individuals that play an
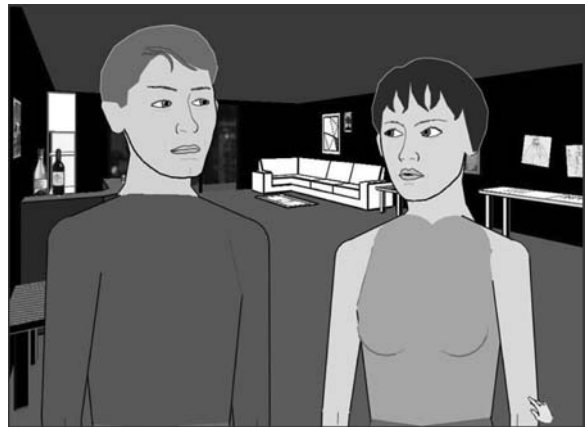
4.18   Façade

increasingly important part of many games' dramatic structures. A good understanding of how to create engaging characters using both traditional dramatic tools and developing AI concepts can add to the effectiveness and believability of characters in your games.

Exercise 4.7: Game Characters

Name three game characters that you find to be compelling. How are these characters brought to life within the game? What allows you to identify with them? Are they rounded or flat, dynamic or static?

Story

We've said that the outcome of a game must be uncertain—that this is part of the formal structure of the game. This is true of a story as well. The outcome of a story is also uncertain (at least the first time we experience it). Plays, movies, television, and games are all media that involve storytelling and narratives that begin in uncertainty and that are resolved over the course of time. However, the uncertainty in a film or a play is resolved by the author, while the uncertainty of a game is resolved by the players. Because of this, it is very difficult to integrate traditional storytelling methods into games.

In many games, story is actually limited to backstory, sort of an elaborate version of premise. The backstory gives a setting and context for the game's conflict, and it can create motivation for the characters, but its progression from one point to the next is not affected by gameplay. An example of this is the trend of inserting story chapters into the beginning of each game level, creating a linear progression that follows a traditional narrative arc interspersed with gameplay that does not affect how the story plays out. Games like the WarCraft or StarCraft series follow this model in their single player modes. In these games, the story points are

laid out at the beginning of a level, and the player must succeed to move on to the next level and the next story point. Like a gameplay version of the Bill Murray film *Groundhog Day,* failure means playing the level again and again until you succeed; only then will the story progress.

There are some game designers who are interested in allowing the game action to change the structure of the story so that choices the player makes affect the eventual outcome. There are several ways of accomplishing this. The first, and simplest, is to create a branching story line. Player choices feed into several possibilities at each juncture of a structure like this, causing predetermined changes to the story. The diagram in Figure 4.19 shows an example of this type of story structure using a simple fairy-tale story we are all familiar with.

One of the key problems with branching story lines is their limited scope. Player choices might be severely restricted in such a structure, causing the game to feel simplistic and unchallenging. In addition, some paths can create uninteresting outcomes. Many game designers believe that there is better potential for use of story in games if the story emerges from gameplay rather than from a predetermined structure. For example, in The Sims, players have used the basic elements provided by the formal system to create innumerable stories involving

their game characters. The system provides features that support this emergent storytelling, including tools for taking snapshots of the gameplay, arranging the snapshots in a captioned scrapbook, and uploading the scrapbook to the Web to share with other users.

In addition to simulation games, other genres are also addressing the possibility of designing for emergent storytelling. This includes games like Black & White, which combine elements of simulation with strategy and role playing, as well as action games like Half-Life, which triggers story sequences depending on player actions, and Halo 2, which uses AI techniques in nonplayer characters to create unique and often dramatic responses to player actions.

While it remains to be seen if these attempts to allow emergent storytelling to arise out of formal game structures will have a significant impact on games, it is certain that game designers are still searching for better ways to integrate story into their systems without diminishing gameplay.

Exercise 4.8: Story

Pick a game that you feel successfully melds its story line with the gameplay. Why does this game succeed? How does the plot unfold as the game progresses?
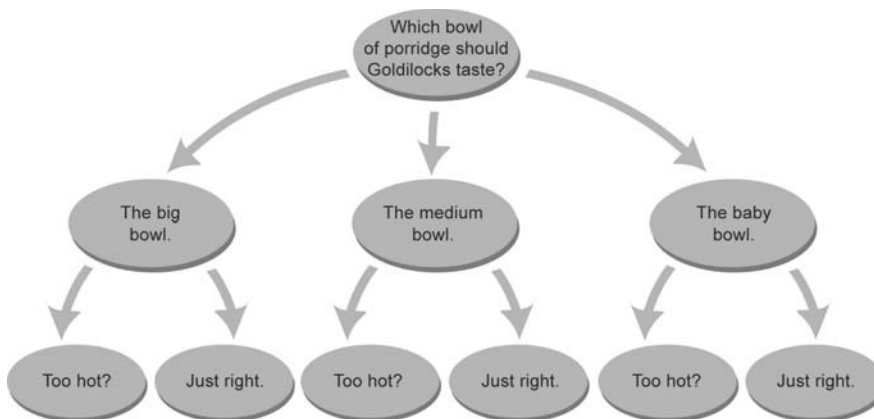
4.19   Branching story structure

The Two Great Myths of Interactive Storytelling

by Jesse Schell

Myth #1: Interactive Storytelling Has Little to Do with Traditional Storytelling

I would have thought that by this day and age, with story-based games taking in billions of dollars each year, this antiquated misconception would be obsolete and long-forgotten. Sadly, it seems to spring up, weedlike, in the minds of each new generation of novice game designers. The argument generally goes like this:

> *"Interactive stories are fundamentally different from noninteractive stories because in noninteractive stories, you are completely passive, just sitting there, as the story plods on, with or without you."*

At this point, the speaker usually rolls back his or her eyes, lolls his or her tongue, and drools to underline the point.

> *"In interactive stories, on the other hand, you are active and involved, continually making decisions. You are doing things, not just passively observing them. Really, interactive storytelling is a fundamentally new art form, and as a result, interactive designers have little to learn from traditional storytellers."*

The idea that the mechanics of traditional storytelling, which are innate to the human ability to communicate, are somehow nullified by interactivity is absurd. It is a poorly told story that does not compel the listener to think and make decisions during the telling. When one is engaged in any kind of story line, interactive or not, one is continually making decisions: "What will happen next?" "What should the hero do?" "Where did that rabbit go?" "Don't open that door!" The difference only comes in the participant's ability to *take* action. The *desire* to act, and all the thought and emotion that go with that, are present in both. A masterful storyteller knows how to create this desire within a listener's mind, and then knows exactly how and when (and when not) to fulfill it. This skill translates well into interactive media, although it is made more difficult because the storyteller must predict, account for, respond to, and smoothly integrate the actions of the participant into the experience.

World Building

While story structure itself is a difficult problem for games and interactive media, there is an aspect of story creation that is a natural complement to game design, and that is world building. World building is the deep and intricate design of a fictional world, often beginning with maps and histories, but potentially including complete cultural studies of inhabitants, languages, governments, politics, economies, etc. The most famous fictional world, and perhaps the most complete, is J.R.R. Tolkien's Middle-earth.

The way that skilled interactive storytellers manage this complexity, while still using traditional techniques, is through the means of *indirect control,* using subtle means to covertly limit the choices that a participant is likely to make. This way, masterful storytelling can be upheld while the participant still retains a feeling of freedom. For it is this feeling of freedom, not freedom itself, which must be preserved to tell a compelling interactive story.

Myth #2: Interactive Storytelling Has Little to Do with Traditional Game Design

I am amazed by the vast number of would-be game designers who whine that while they are brimming with great game design ideas, they lack the large team required to implement these ideas, and therefore they are unable to practice their craft.

This is nonsense of the highest order. A game is a game is a game. The design process for a board game, a card game, a dice game, a party game, or an athletic game is no different from the process of designing a video game. Further, a solo designer can fully develop working versions of these nonelectronic games in a relatively short time. Making and analyzing traditional games can often be far more instructive than trying to develop a fully functioning video game. You can learn much more about game design in a much shorter time, and you won't have to concern yourself with the technical headaches and limitations involved with interactive digital media. If you really want to understand how to create good interactive entertainment, first study the classics, and then try to improve on them. Riddles, crossword puzzles, chess, poker, tag, soccer, and thousands of other beautifully designed interactive entertainment experiences existed long before the world even knew what a computer was.

To sum up: New technologies allow us to mix together stories and games in interesting ways, but there are very few elements that are fundamentally new—most designs are simply new mixtures of well-known elements. If you want to master the new world of interactive storytelling, you would be wise to first understand the games and stories of old.

About the Author

Jesse Schell was formerly the creative director of the Walt Disney Imagineering VR Studio, where his job was to invent the future of interactive entertainment for the Walt Disney Company. Now he is professor of entertainment technology at Carnegie Mellon University, specializing in game design. He also is the CEO and chief designer at Schell Games, a studio that specializes in the design and development of unusual video games.

Tolkien began by creating languages, then the creatures who spoke them, and later the stories that took place in the world. Many games and films are created using world building techniques, which, though not as detailed as Middle-earth, give them a sense of depth and story potential that keeps players interested over long periods of times. The World of Warcraft universe is a good game-based example, as the Star Wars universe is an example that spans both films and games.

The Dramatic Arc

We have looked at a number of key elements that can help to create player engagement with the game system. But the most important of these elements is actually one that we have talked about already, and that is conflict.

Conflict is at the heart of any good drama, and, as we have seen in our discussion of formal elements, it is also at the heart of game systems. Meaningful conflict is not only designed to keep players from accomplishing their goals too easily, as we pointed out in the discussion of formal elements, but it also draws players into the game emotionally by creating a sense of tension as to the outcome. This dramatic tension is as important to the success of a game as it is to a great film or novel.

In traditional drama, conflict occurs when the protagonist faces a problem or obstacle that keeps her from accomplishing her goal. In the case of a story, the protagonist is usually the main character. In the case of a game, the protagonist can be the player or a character that represents the player. The conflict that the player encounters can be against another player, a number of other players, obstacles within the game system, or other forces or dilemmas.

Traditional dramatic conflict can be broken down into categories such as character versus character, character versus nature, character versus machine, character versus self, character versus society, or character versus fate. As game designers, we might overlay another group of categories, which are player versus player, player versus game system, player versus multiple players, team versus team, etc. Thinking about game conflict in this way helps us to integrate a game's dramatic premise and its formal system, deepening the players' relationships to both.

When the conflict is set in motion, it must escalate for the drama to be effective. Escalating conflict creates tension, and in most stories, the tension in a story gets worse before it gets better, resulting in a classic dramatic arc. This arc describes the amount of dramatic tension in the story as it progresses in time. Figure 4.20 shows how tension rises and falls during various stages of a typical story. This arc is the backbone of all dramatic media, including games.

As the figure shows, stories begin with exposition, which introduces the settings, characters, and concepts that will be important to the rest of the action. Conflict is introduced when the protagonist has a goal that is opposed by their environment, an antagonist, or both. The conflict, and the protagonist's attempt to resolve it, causes a series of events that lead to a rising action. This rising action leads to a climax, in which some sort of deciding factor or event is introduced. What happens in the climax determines the outcome of the drama. The climax is followed by a period of falling action in which the conflict begins to resolve, and the resolution, or dénouement, in which it is finally resolved.

To better understand the classic arc, let's look at in terms of a simple story you are probably familiar with. In the movie *Jaws*, Sheriff Brody is the protagonist. His goal is to keep the people of Amity safe. The antagonist is the shark, who opposes Brody's goal by attacking the people of Amity. This creates a conflict between Brody and the shark. Brody, who is afraid of the water, attempts to keep the people safe by keeping them out of the water, but this plan fails. The tension rises as the shark attacks more people, even threatening Brody's own children. Finally, Brody must face his fear and go out on the water to hunt down the shark. In the climax of
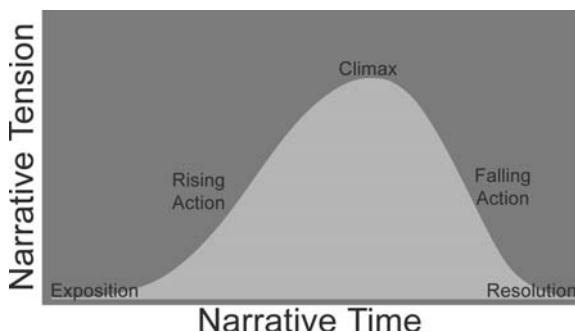

4.20   Classic dramatic arc

the story, the shark attacks Brody. The story resolves when Brody kills the shark and returns the story to the status quo. Simple, right? You can look at any story you know and you will see the dramatic arc reflected in its structure.

Now, let's look at the arc again, this time in terms of a game. In a game, the rising action is linked to both the formal and dramatic systems. This is because games are usually designed to provide more challenge as they progress. Games that also have well-integrated dramatic elements will intertwine those elements with the formal system so that as the challenge rises, the story develops. Here is an example from a classic game: In Donkey Kong, Mario is the protagonist. Mario's girlfriend, Pauline, has been kidnapped by the giant ape, Donkey Kong, and taken to the top of a building under construction. Mario's goal is to save Pauline before time runs out. To do so, he must climb the levels of the building, traversing girders, elevators, and conveyer belts, while avoiding flames, barrels, and bouncing rivets thrown at him by Donkey Kong. Each time Mario reaches Pauline, Donkey Kong grabs her and carries her off to the next higher level. Each level builds in difficulty, creating rising tension for the player. Finally, in the climax of the game, Mario must not only avoid Donkey Kong's attacks but also fight him directly by removing all the rivets on every floor of the level. After the rivets are removed, Donkey Kong falls head first onto a stack of girders and is knocked out, allowing Mario to rescue Pauline and resolve both the formal and dramatic tension.

It is clear from even these simple descriptions that the story in *Jaws* is more developed as to character and story—Brody has a fear that he must overcome to solve the problem, and his character changes in motivation as he goes from protecting all the people of Amity, to saving his own family, to defending himself from the shark. While Mario has a goal, and he is certainly vulnerable to attacks from Donkey Kong, he does not have any internal conflict that keeps him from completing his goal, and his goal never wavers. The jeopardy that Pauline is in never increases either, a touch that would have made the formal and dramatic systems of the game better integrated.

What Mario has that Brody does not, however, is that his success or failure is in the hands of the player. It is the player who must learn how to avoid the attacks, moving closer and closer to the goal. And in the climax of the game, it is the player who must figure out how to topple Donkey Kong from his perch and knock him out. So while our response to the climactic moment in *Jaws,* when Brody figures out how to finally kill the shark, is a release of tension built up by our empathy for his character and the character's struggles over the course of the story, our response to the climatic moment in *Donkey Kong* is quite different.
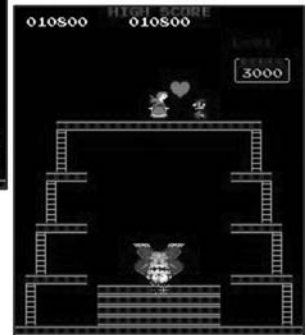
4.21   Donkey Kong

In the case of *Donkey Kong*, we are the ones who have figured out the crucial action needed to resolve the tension, and that tension has built up over a number of levels of play. When we finally resolve that tension, there's a sense of personal accomplishment on top of any sympathetic response that we might have to the resolution of Mario and Pauline's story. This integration of conflict in the formal and dramatic systems can clearly provide a powerful combination for the players in a game experience.

Exercise 4.9: Plotting a Story, Part 1

Choose a game that you've played all the way through. Make certain it is a game with a story involved. For example Halo 2, Deus Ex, Gears of War, or Star Wars: Knights of the Old Republic, might be a good choice. Now, plot the story against the dramatic arc.

- How is the exposition handled? Who is the protagonist? What is the main conflict, and when is it introduced?
- What does the protagonist do to resolve the conflict?
- What causes the tension in the story to rise? What deciding factor brings the story to a climax?
- What happens in the resolution?

Exercise 4.10: Plotting a Story, Part 2

Now take the same game and plot the gameplay against the dramatic arc.

- What elements of gameplay, if any, support each of these points?
- How is the exposition of gameplay handled? Are controls and mechanics clearly explained? Are they integrated with the dramatic premise? Is the goal clearly stated and integrated with the main conflict of the story?
- How does the gameplay cause the dramatic tension to rise?
- What deciding factor in the gameplay brings the game to a climax?
- What happens in the resolution? Do the dramatic elements and gameplay elements help or hinder each other?
- How might they be better integrated to make the game work from an emotional standpoint?

Exercise 4.11: Plotting a Story, Part 3

Take the same game and come up with three changes to the story or gameplay that you believe would make the two better integrated.

Conclusion

The elements of drama that we have looked at form the basis of a tool set that the game designer can use to elicit powerful emotional reactions from players. From integral game concepts like challenge and play, to complex integration of premise, characters, and story, these tools are only as powerful as the inspiration behind their use. Although the media palette of game design has grown to rival film and television, it is clear that the emotional impact of games still has not achieved the depths it is capable of and that will make it recognized as an important dramatic art form.

What new areas of dramatic possibility do you see? What new ground will your designs break? To answer these questions, you must have a strong grasp of the tools of traditional drama and understanding of good gameplay and the process by which it can be achieved. Before going on to read about system dynamics in games, spend some time with the exercises in this chapter if you have not already done so, because they are designed to help you practice with some of these traditional tools.

Designer Perspective: Dr. Ray Muzyka

CEO and Coexecutive Producer, BioWare Corp.

Dr. Ray Muzyka is a game designer, producer, and entrepreneur whose credits include Baldur's Gate (1998), Baldur's Gate: Tales of the Sword Coast (1999), MDK 2 (2000), Baldur's Gate II (2000), Baldur's Gate II: Throne of Bhaal (2001), Neverwinter Nights (2002), Neverwinter Nights: Shadows of the Undrentide (2003), Neverwinter Nights: Hordes of Underdark (2003), Star Wars: Knights of the Old Republic (2003), Jade Empire (2005,) and Mass Effect (2007).

How did you get into the game industry?

My original background was training and practice as a medical doctor. Dr. Greg Zeschuk and I cofounded BioWare back in 1995 after working on the programming and art for a couple of medical education projects for our university. We met some talented programmers and artists who worked on what became BioWare's first game, Shattered Steel. We never looked back, and now we have over 160 talented, smart, creative, hard-working employees at BioWare, working on three to six projects at any one time.

On favorite games:

My favorite games cover a lot of platforms and a long time period. Back in the early 1980s I was a big fan of some of the great role-playing franchises, such as Wizardry and Ultima on the Apple II. Later on, I was a big fan of games like System Shock and Ultima Underworld on the IBM PC. These too were role-playing games, revolutionary for their time in their interface, graphics, and storylines, and still worth playing. More recently I've enjoyed a number of console RPGs including Final Fantasy VII, Chrono Cross, and the Zelda series. I also enjoy a bunch of other types of games such as real-time strategy (WarCraft II, StarCraft, Age of Empires) and first person action games like Halo, Battlefield: 1942, and Half-Life. All of these games share the common traits of being very good at what they set out to do. This is what we try to do in our games at BioWare; we try to make each game better than our last.

Advice to designers:

Be passionate but self-critical. Never compromise on quality, but do realize that there is a point of diminishing returns on effort and a point where every game is "as good as you can make it." Most games never reach this point, but if they do, you'll increase the chances of it succeeding by a lot. And for those entrepreneurial types out there, hire smart, talented, creative, and hard-working staff to work with and make sure you treat them extremely well—video games are not a solo endeavor, and the team sizes required to keep the production values high enough for the increasingly sophisticated video game audiences seem to grow larger every year.

Designer Perspective: Don Daglow

President, Stormfront Studios

Don Daglow is a pioneer of the game design industry whose credits include the preindustry PDP games Baseball (1971–1974), Star Trek (1972–1973), and Dungeon (1976–1978); as well as commercial titles ranging from Utopia (1982), World Series Baseball (1983), Adventure Construction Set (1985), Racing Destruction Set (1985), Earl Weaver Baseball (1987), NASCAR 99 (1998), NASCAR 2000 (1999), Tony La Russa's Ultimate Baseball (1991), Neverwinter Nights (1991), and The Lord of the Rings: The Two Towers (2002).
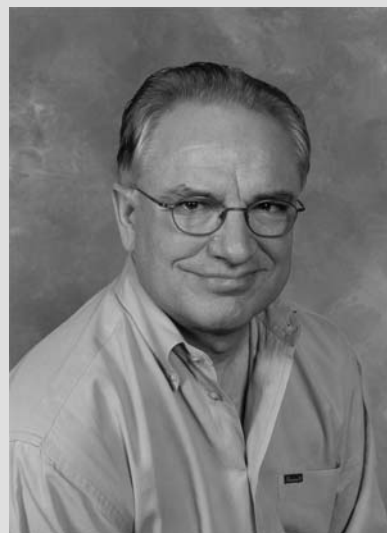
On getting into the game industry:

I had been writing games as a hobby on the university mainframe through my college and grad school years, and then while I was a grad school instructor, teacher, and writer.

When Mattel started their in-house Intellivision game design team, they advertised on the radio for programmers who wanted to learn how to create video games. I'd never have thought of looking in the paper for a games job, but I heard the radio ad and called them. When I said, "I don't have a computer science degree, but I've been programming games for the last nine years," I think they thought I was making up stories because Pong had only been out for about five years at the time. Fortunately, it all worked out, and I was selected as one of the original five members of the Intellivision game design team at Mattel. As the team grew, I ended up being director of Intellivision game development.

On favorite games:

- *Seven Cities of Gold, design by Dan Bunten and Ozark Softscape, published by EA, 1984*: The game has only a handful of resources to manage and a gigantic map to explore for treasure. It is proof that a simple concept with few moving parts on a primitive machine with basic graphics can be compelling if the tuning of challenge, suspense, and reward is elegant and subtle.
- *The original Super Mario Bros. for Nintendo, design by Shigeru Miyamoto, 1985*: The game style has been the subject of endless variations, but this game to me is the foundation on which all the others are built. Just the right balance of eye-hand coordination, environmental and enemy challenges, hidden goodies, and ongoing positive reinforcement made this a game that adults and kids could both play and love.

- *Sim City, design by Will Wright, published by Maxis, 1989*: This game redefined what a computer game could be and was fun despite breaking many of the commonly accepted design commandments: It had no true opponents (apart from an occasional visit by Godzilla), a score with no clear methodology as to how you earned it, and no clear final goal so you could play for as long as you wanted. Will Wright persevered through repeated rejections before finding a publisher for one of the biggest hits in the history of the industry.

- *John Madden Football for Sega Genesis, design by Scott Orr and Rich Hilleman, published by EA, 1992*: The first console version of Madden Football created a monster franchise in the industry, but what made it shine initially was a beautifully tuned head-to-head gameplay mechanic that made playing your buddies an incredibly fun way to pass an afternoon.

- *Metal Gear Solid 2 for PS2, published by Konami, 2001*: The cinematic coverage of both stealth and combat advanced the use of cameras in our craft. Where Final Fantasy featured episodic tours de force, Metal Gear Solid started to blur the line between film and game.

- *Lord of the Rings*: *The Two Towers, design by LotR design team, developed by Stormfront Studios, published by EA, 2002 (conflict of interest note: our team created this game):* We started out talking about making the transition from a movie to a game seamless so you reached a moment of interactivity thinking you were still watching a theatrical film. This is a dream many of us had discussed for years. Unlike many dreams, this time we actually pulled it off. Having now done it once, the result has inspired us about a much wider range of effects we can create in future games.

Advice to designers:

Enjoy the journey, not just the wrap party. I see many people enter our industry who are anxious to be the next Shigeru Miyamoto or Will Wright. Most well-known designers are the product of the special cases of their era, and rarely are they well known in later phases of industry history. For every Miyamoto and Wright there are many designers who were once trumpeted in the industry press but who have now faded from the scene and are forgotten.

If I look at the people who have had the most success in the industry over the last 10, 15, or 20 years, a simple truth emerges. You have to do what you love, and you have to keep growing as you do it, in all areas of your personal and professional skills.

If you love games and love the process of creating them, it will rub off on everyone around you. If you keep looking for how to do a task better than the last time you did it, you'll grow. Your career will still have ups and downs, but it will advance.

If you embark on a master plan to become a video game celebrity by age 30, you stop thinking about building great games and start thinking about your personal pride. At that moment the energy that should be going into the craft of game design and execution instead goes into career planning. Which, of course, is the fastest way to sabotage your career. The person who is unhappy until they achieve their goal spends most of their time unhappy. The person who enjoys the journey toward the goal—and is resolute about reaching it—is happy most of the time.

Further Reading

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McCloud, Scott. *Understanding Comics: The Invisible Art*. New York: HarperCollins Publishers, 1994.

Murray, Janet. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge, MA: The MIT Press, 1997.

End Notes

1. Csikszentmihalyi, Mihaly. *Flow: The Psychology of Optimal Experience*. New York: Harper & Row Publishers, Inc., 1990. p. 49.
2. Ibid.
3. Ibid, p. 53.
4. Ibid, pp. 58–59.
5. Ibid, p. 61.
6. Ibid, p. 63.
7. Ibid, p. 66.
8. Brown, Stuart, and Kennard, David. Executive Producers. *The Promise of Play*. Institute for Play and InCA Productions, 2000.
9. Sutton-Smith, Brian. *The Ambiguity of Play*. Cambridge, MA: Harvard University Press, 1997. pp. 4–5.
10. *The Promise of Play*.
11. Activision, Pitfall instruction manual, 1982.