Game Invaders

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Game Invaders
The Theory and Understanding of Computer Games

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Mike Lockyer
Jo Clay
Paul Massey

Contents

v

Preface

Game Invaders and Game Invaders Live (GIL) have interesting histories, and it is worth a few words to outline them, as they do to some extent explain why both are as they are.

Degrees in games—video games, as they used to be called—have been around for about 15 years at the University of Teesside and a few others. When they began there was very little theoretical and/or analytical material with which to establish game courses at an appropriate academic level. In the mid-1990s Clive went in search of suitable theory, found some, found he had to invent some, and began to put this together in his teaching: a final year undergraduate course called Game Futures. The idea was that students thought about the future of games rather than Clive telling them what that future would be. This was just as well, as Clive didn't know the future of games and would have wanted a lot more money to tell anyone who wanted to know if he did. The history of what would become this book and GIL had begun.

Games people wrote about how to develop games, how to design them, and what the industry expected, and gradually the academic community got its act together and suitable theory and analytics began to appear.

In 2003 Clive started writing a book based on what is now much of the book you now have in your hands. And a publisher got interested and all was going well until the publisher, or rather the editor Clive was talking to, stopped talking. The idea of a book was put on hold because at about that time, Teesside University put out a call for staff who were interested in developing their entrepreneurial sides. Clive was fed up being messed around by the publishing world and decided that there might be a business opportunity in selling analysis data on games to game developers and the like. The university and a regional "Proof of Concept" fund agreed with him, and in 2004 a company called Strange Agency was set up. Jo Clay was its first, and for a while only, employee while Clive continued with the day job and the company, which was also a day job. Mike and Paul got involved as software and database experts respectively and along with Clive, Jo, the university, and the Proof of Concept Fund became shareholders and board members.

The idea was that the analysis data should be automatically generated and made available through a software system that accessed data from the company's web server. The desktop software worked well and data on thousands of games were collected and made available. People in the games industry were quite interested and the team demonstrated at trade shows such as E3 and tried to drum up business. But sales were hard, very hard, to come by and eventually after many trials and tribulations Strange Agency was wound up in 2009.

ix

Rather than let it all go to the wall, Clive, Mike, Jo, and Paul decided to return to the original idea of publishing a book. Mike completely rewrote the software so it ran wholly on the web as a Silverlight application, and the book was rewritten to incorporate all that they had learned about games analysis. GIL meant that students and teachers could undertake their own analyses to support the theory and examples in the book. The current book, web app, and website, a truly multi-media publication, came into being.

So this book and GIL are the products of people who have worked and researched in the games industry and taught and researched in academia. This is a truly informed offering and we hope you find it useful.

<div align="right">

CLIVE FENCOTT
MIKE LOCKYER
JO CLAY
PAUL MASSEY

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Abbreviations

AG – Activity Group

CBS – Computer Based Signs

DM Level – Death Match level

DPC – *Driving/Piloting/Crewing*, in GIL mapping of known genres

DS – Ninitento handheld game console

FADT – Formal Abstract Design Tools

FPS – First Person Shooter, game genre

GI – Game Invaders

GIL – Game Invaders Live

GIS – Generalized Interaction Sequence

HUD – Heads up Display

IGN – Games review web site

IS – Interaction Sequence

MMORPG – Massively Multi-player Online Role Playing Game

MOO – MUD Object Oriented, see MUD

MUD – Multi-user Dungeons and Dragons

NPC – Non Playable Character

PDP-1 – very early mini-computer from the 1960s: huge by today's standards

POs – Perceptual opportunities

PRS – Pre-rendered sequences

PSAS – Pre-scripted action sequences

QTE – Quick Timer Events as in Shenmue and

RPG – Role-playing game

RTS – Real time strategy game

SNES – Super Nintendo Entertainment System

VE – Virtual Environment

VR – Virtual Reality

Wii – Ninendo game console with motions tracking etc.

Xbox – Microsoft game console

XML – Extensible Markup Language
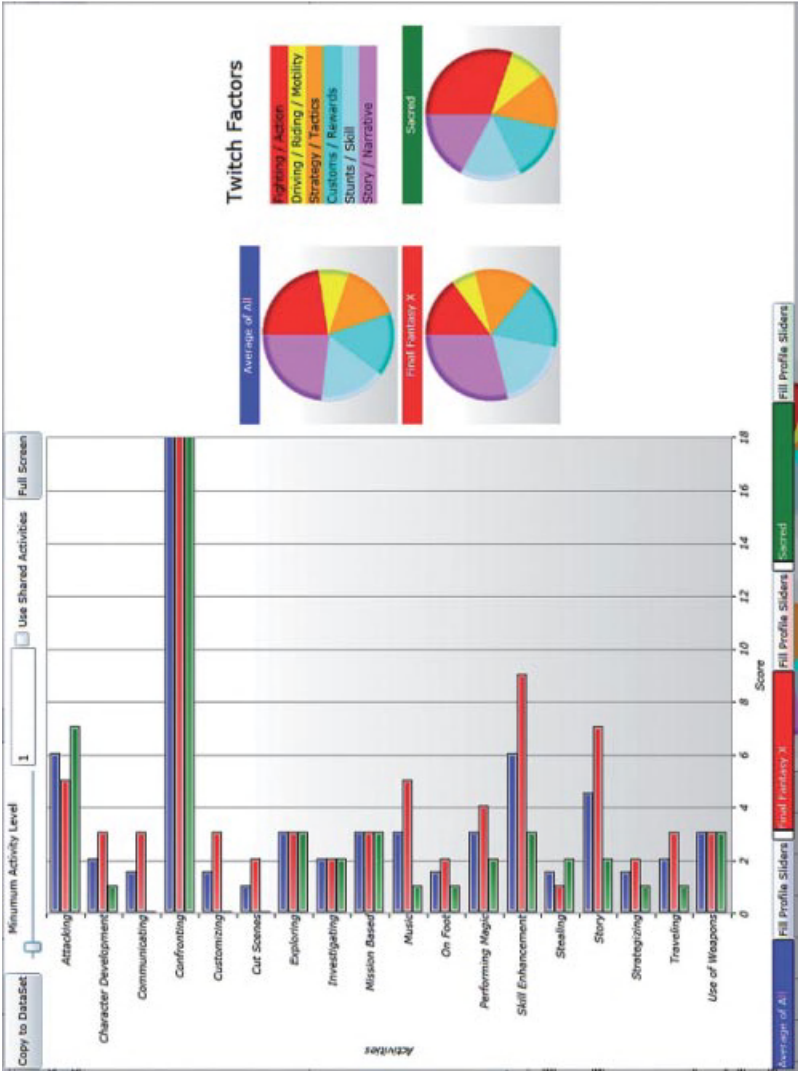
Figure 3.1 Activity profiles for Final Fantasy X and Sacred.
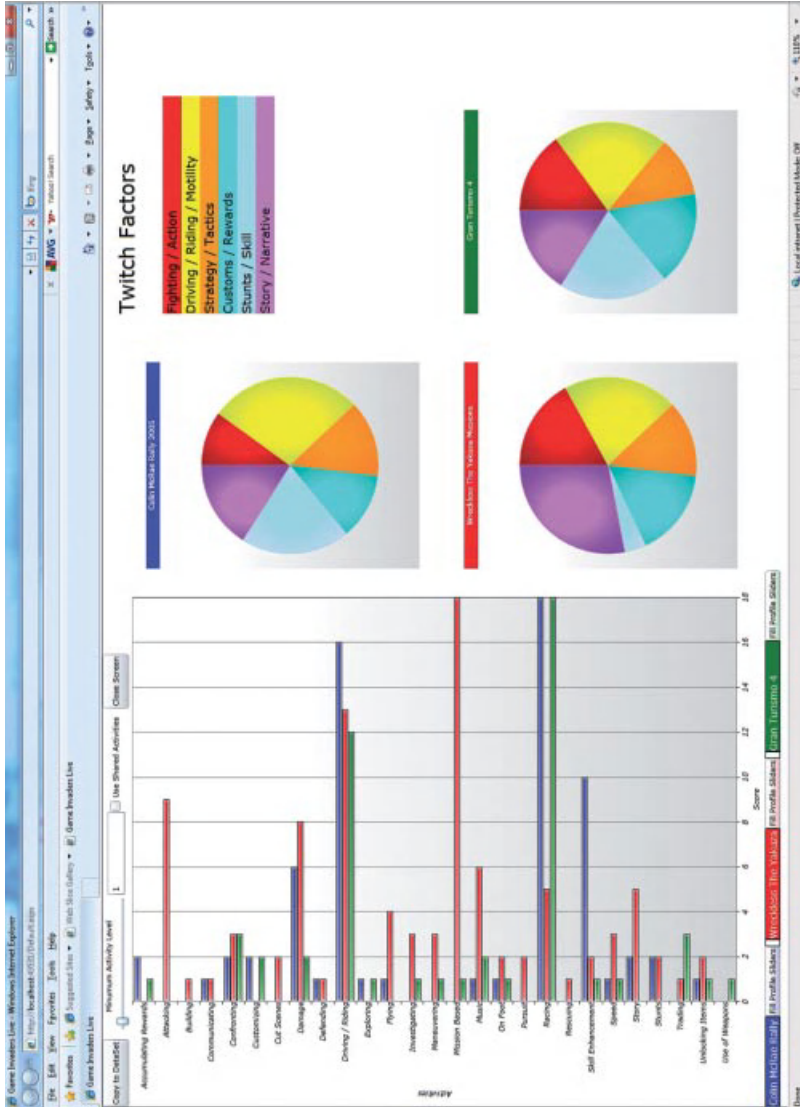
Figure 3.2 Activity profiles for three racing games.
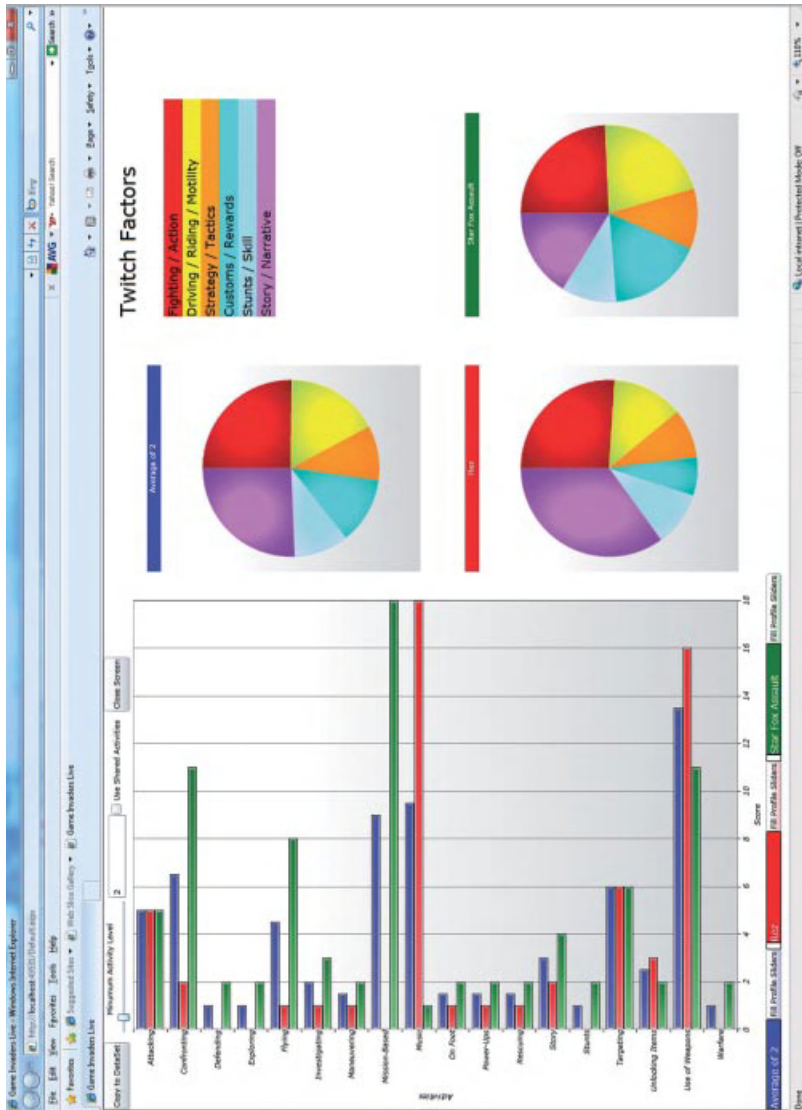
Figure 5.1 Activity profiles for Star Fox Assault and Rez.
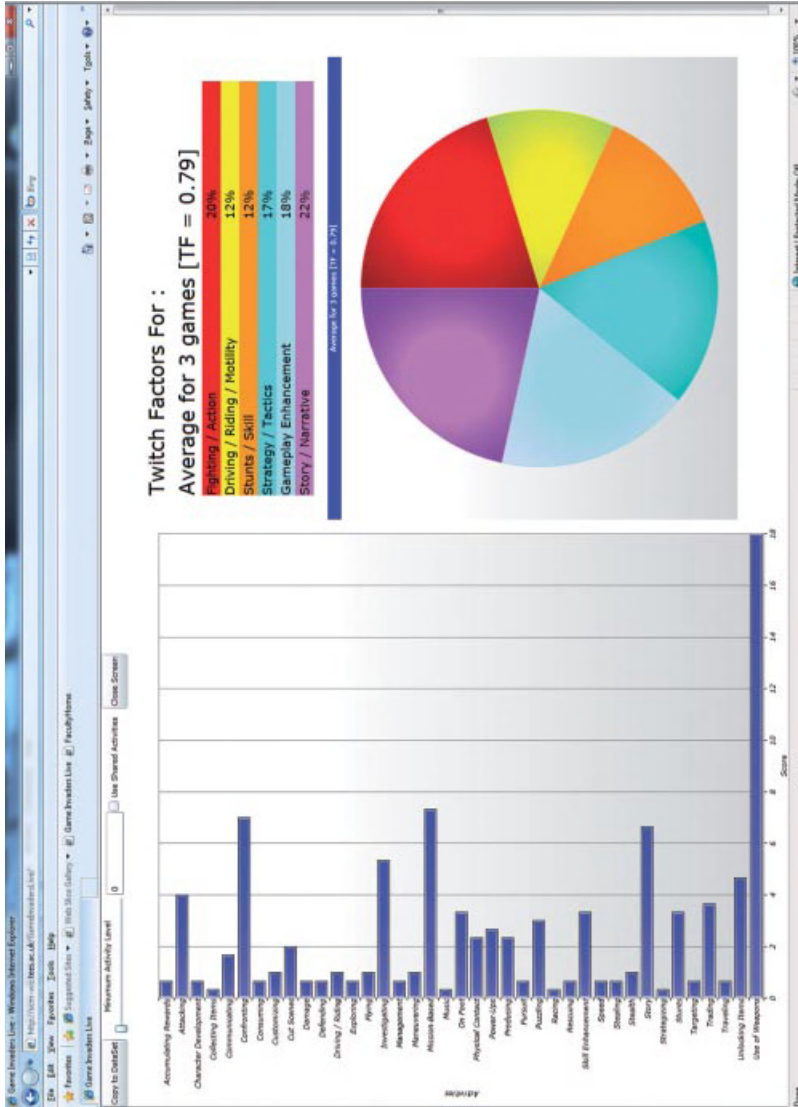
Figure 6.1 Activity profile and twitch factor for Resident Evil.
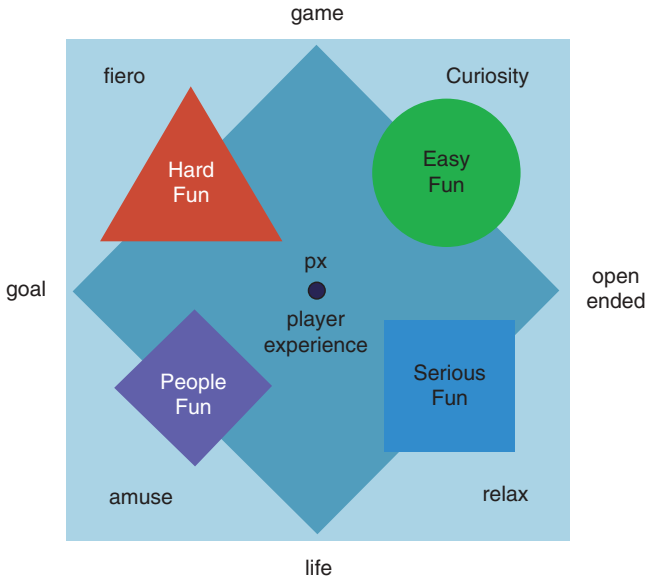
Figure 6.2 Emotional models of play. (Courtesy of XEODesign, http://www.xeodesign.com/whyweplaygames.html.)
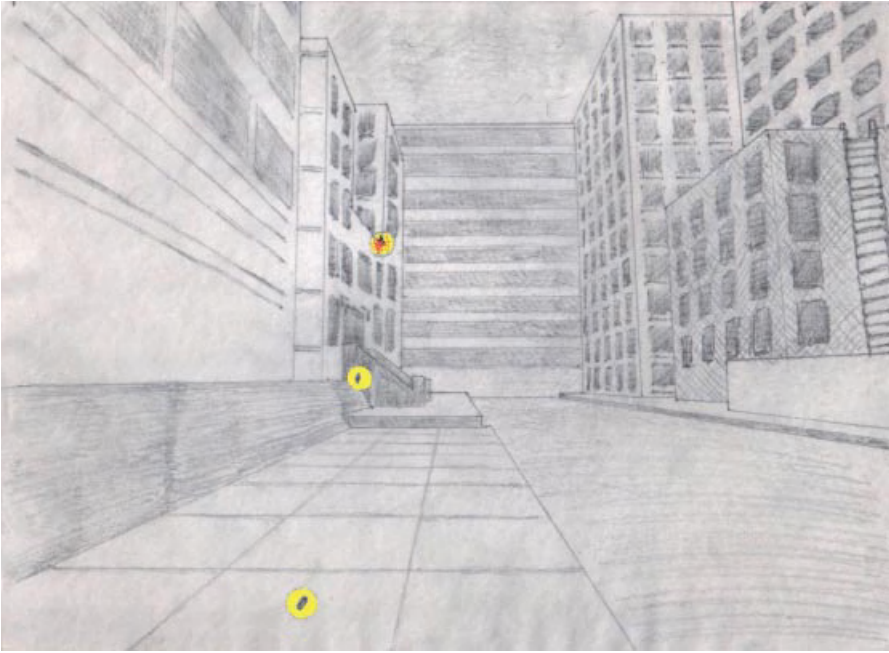
Figure 7.2 First SinCity screen shot.
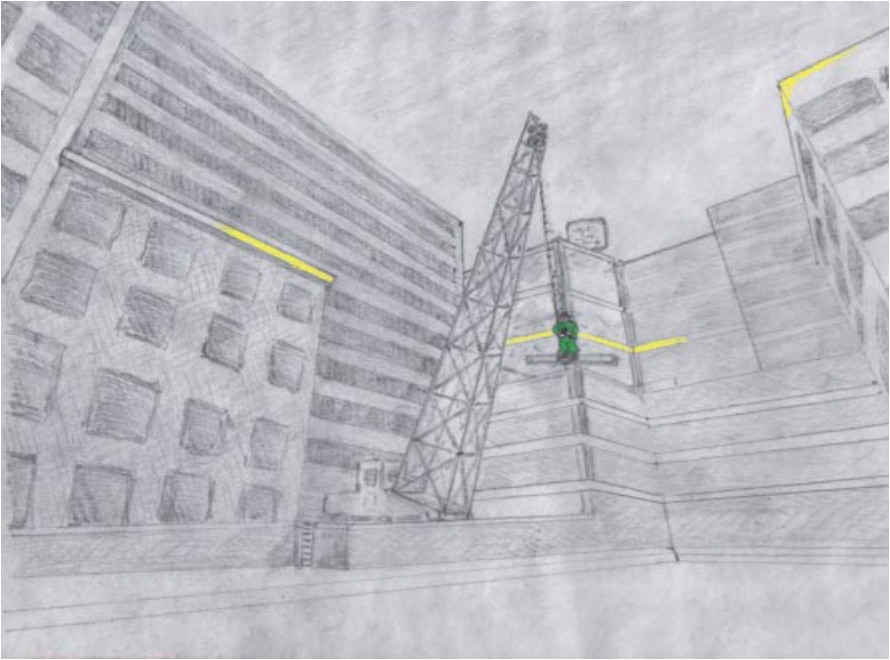
Figure 7.3 Second SinCity screen shot.
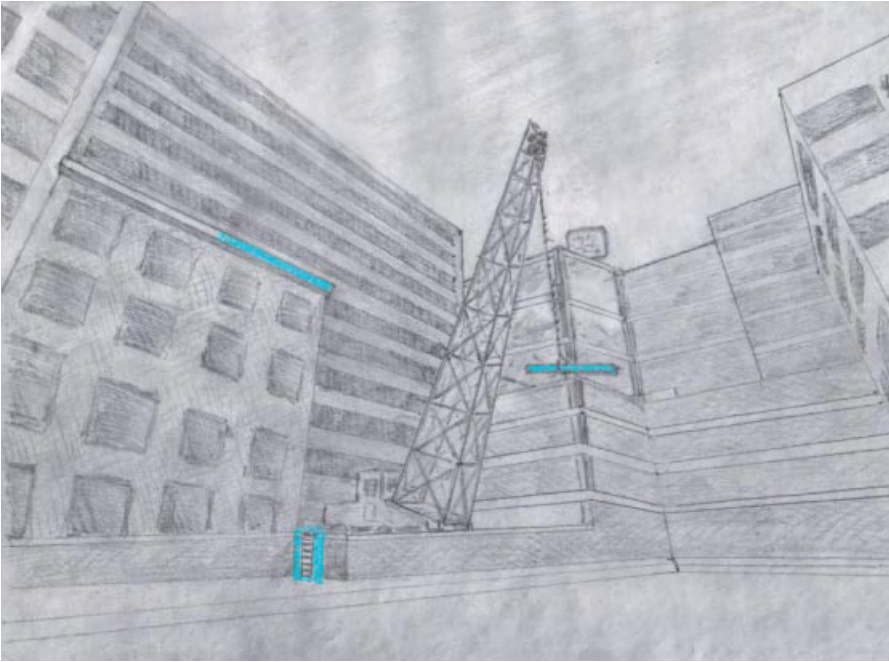
Figure 7.4 Third SinCity screen shot.
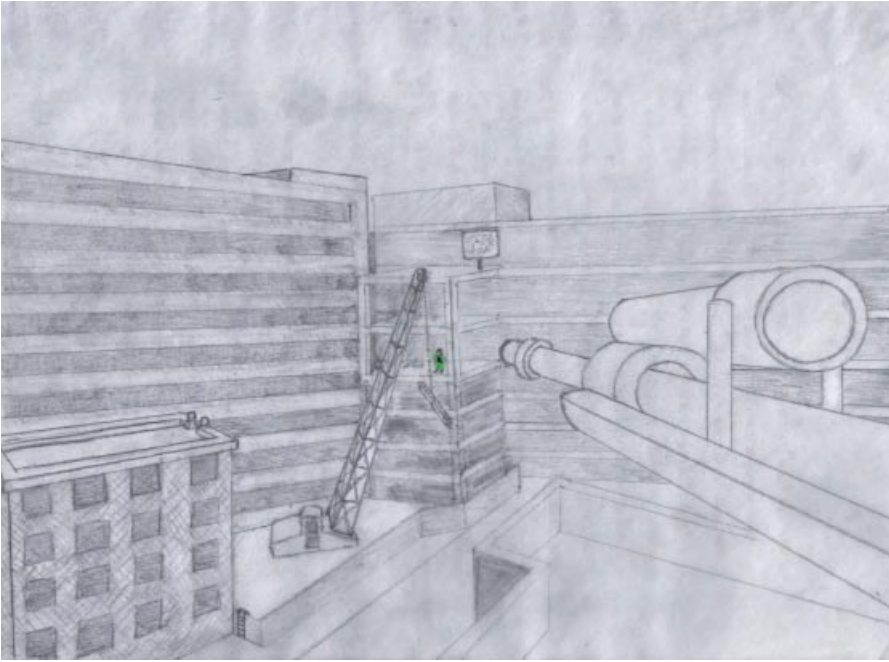
Figure 7.5 Fifth SinCity screen shot.
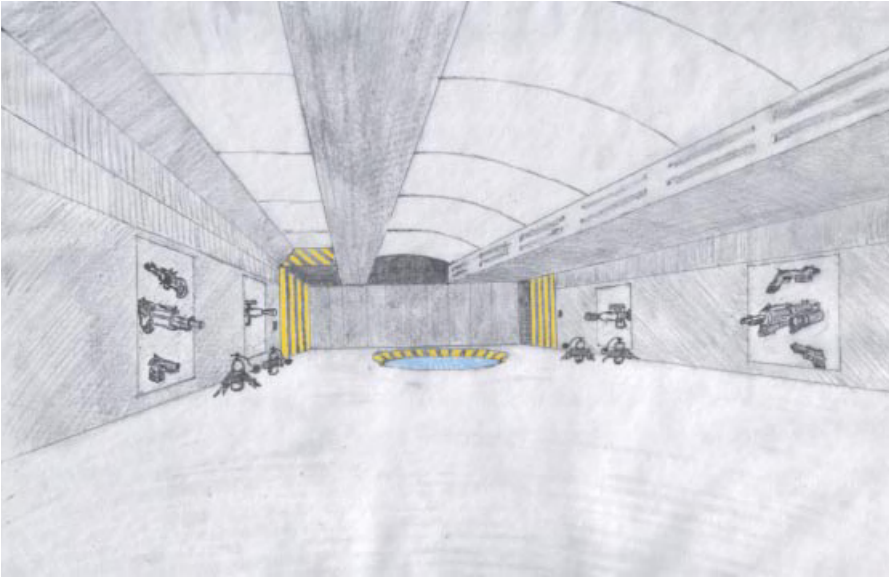
Figure 7.7   Entry room on arrival.
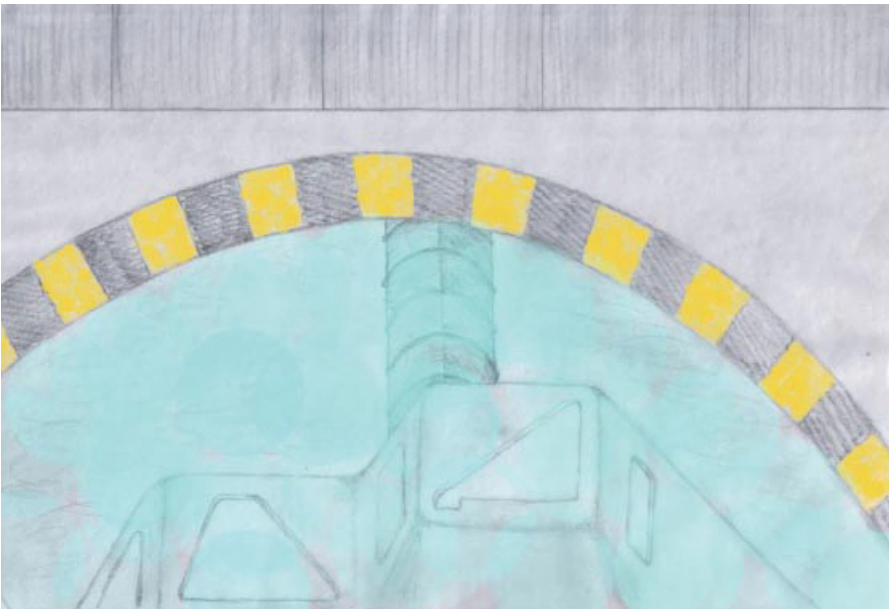
Figure 7.8   Entry room after moving forward.
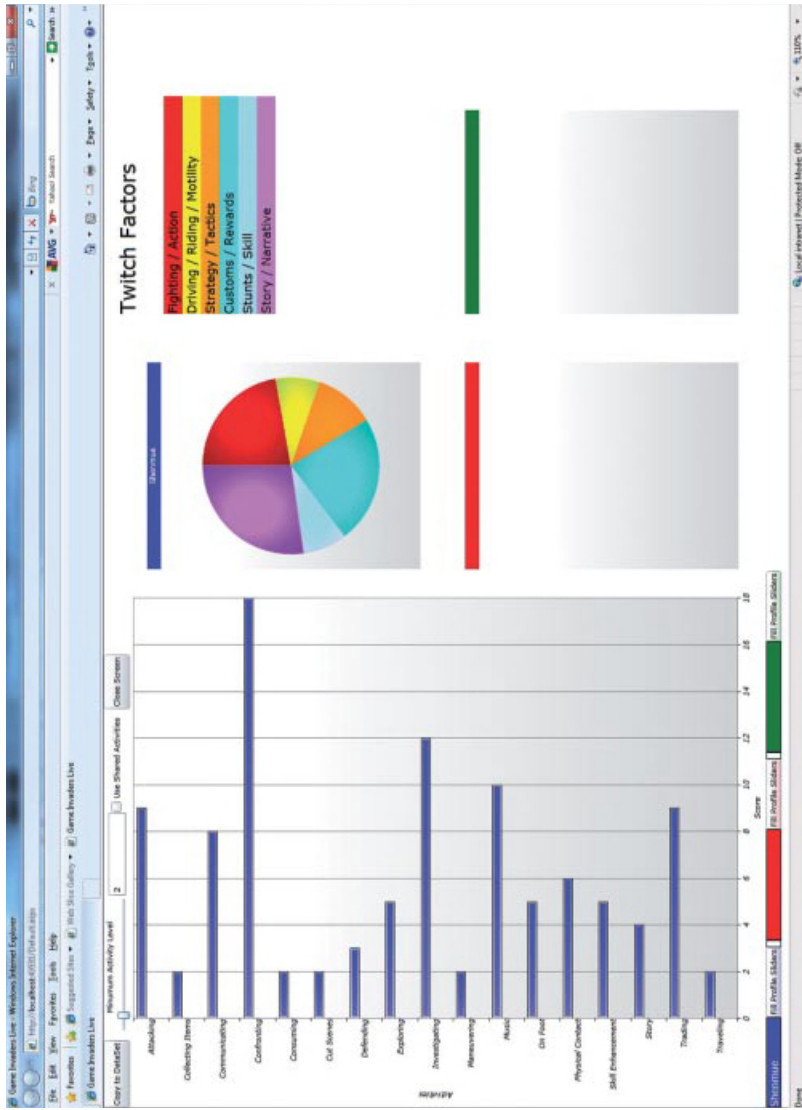
Figure 9.1 Activity profile for Shenmue on the Dreamcast.
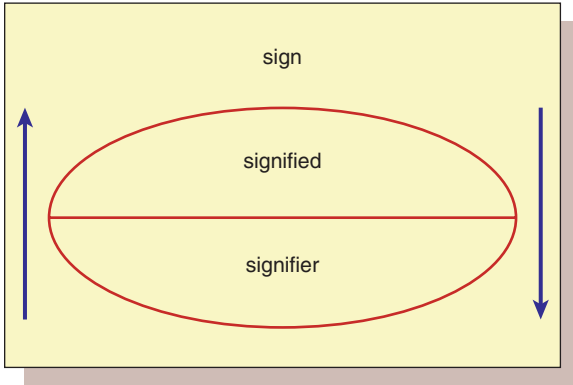
Figure 10.1 Characterization of the sign. (Courtesy of Daniel Chandler, Aberystwyth University.)

Figure 10.2 Two signs for "tree."

Figure 10.3 A photograph of a tree.
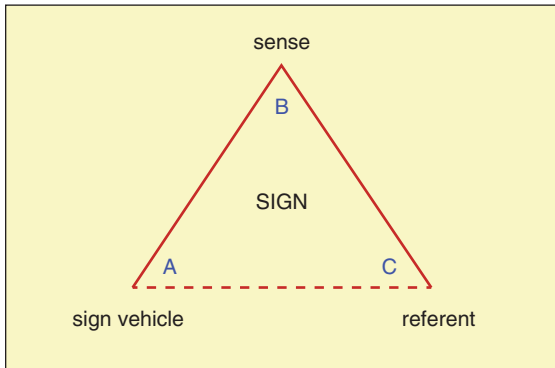
Figure 10.4 Peirce's characterization of the sign. (Courtesy of Daniel Chandler, Aberystwyth University.)
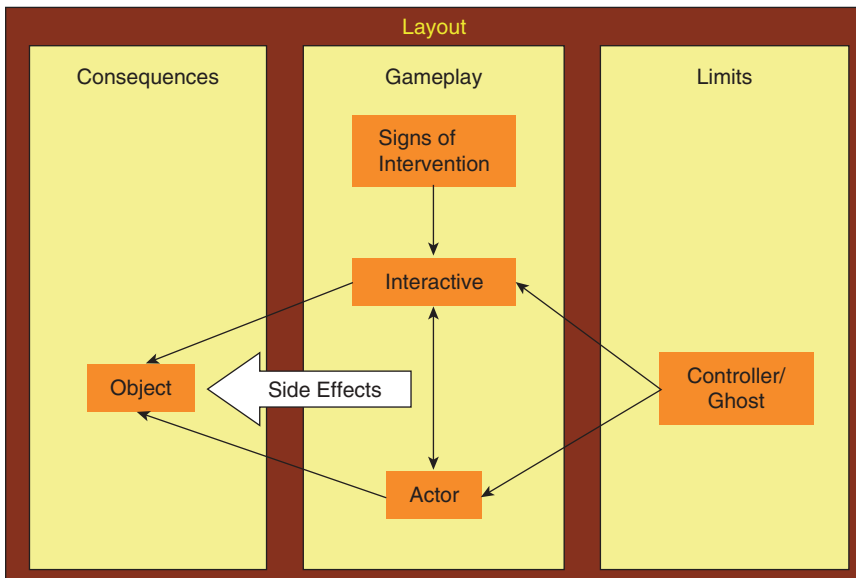
Figure 11.1 Relationships between computer-based signs.
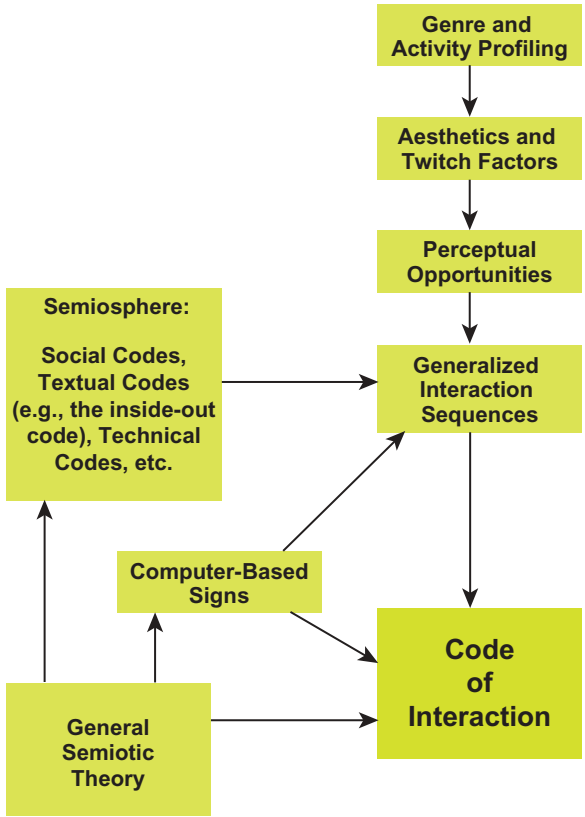
Figure 12.1   Semiosphere for video games.
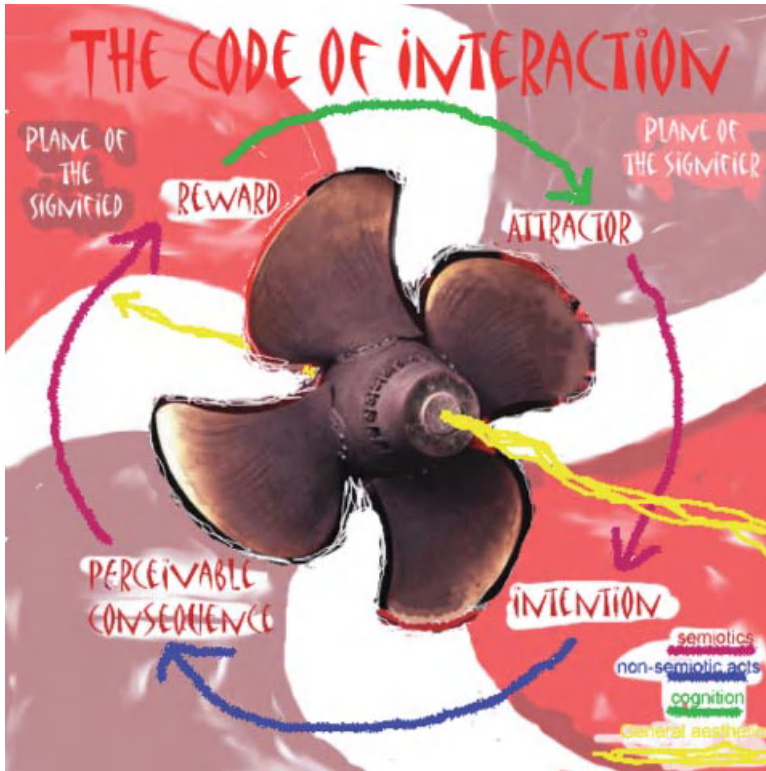
Figure 12.2 The Code of Interaction.

Part I

Why Do People Play Games?

Chapter 1

You Are the One

Games are about creativity! Right? Games are about great gameplay ideas translated into great graphics and sound! Right? And because they're creative there is no place for science and experiments and all that measurement stuff that comes with them. Games should be purely about creativity! Right? Wrong! They can't be. Games are probably the most technological, most science-based entertainment medium there is. There are aspects of physics and rag dolls and collision detection and a whole lot of other stuff involved, not to mention math and programming. Games are where creativity and technology meet head on. That's what makes them so fascinating to study.

This book is an investigation into the nature of computer games. It's an invasion that gets below the pixelated surface and digitized sound the player sees and hears; that gives designers and producers and publishers tools to gain their own insights into how existing games work, to get some clues as to where games are going and, maybe, to give the investigator an edge in a hugely competitive world. There's bound to be a few maybes here; games are too big and complex and there are too many of them for there not to be a few maybes.

This book offers you some very practical tools to work with in analyzing games; they are also tools to think and invent with. It's all based on a module Clive ran in the School of Computing at Teesside University in the North East of England. The module was called "Games Futures" and was mostly taken by students in their final year of the BSc Computer Games Design degree. It was designed to make students think about computer games in a more fundamental way. By their very nature, computer games are designed to deceive. They are designed so that the player is deceived into believing that the flickering pixels and digitized sounds amount to something real: a planet in the far future, a steampunk city, a football game, a Formula One Grand Prix, and so on. Of course the player is more than willing to go along with this deception if he or she possibly can. Most of us want to be deceived by computer games. That is when the fun starts. Hence the term "willing suspension of disbelief" coined by the poet Coleridge (1817) way back in the beginning of the nineteenth century. He was talking about the power of poetry to conjure up images and imaginary worlds but his words apply just as well to computer games.

Figure 1.1

But our very willingness to suspend our disbelief becomes a real problem when we try to understand why we submit so readily to the deceptions of computer games. They are so good at deceiving us it is difficult to be objective when we need to see through the illusion.

We need some help, but not the kind of help shown in Figure 1.1!

But let's think about *The Matrix* for a moment. At the climactic moment of the film, Neo—who already knows that the world people live in is a machine-made illusion—is brought back to life by Trinity. He gets back on his feet and looks down the corridor at the three sentinels walking away from him. They sense his presence and turn to face him with amazement. Neo now sees "through" the superficial world created by the machines and sees instead the code from which it is constructed. But he knows more than he apparently sees. As the sentinels fire their guns and the bullets race toward him he realizes he is no longer subject to the constraints on interaction imposed by the world he has lived in all his life. He can stop the bullets in midair, he can play with them, he can make up his own ways of interacting with the world

he thought he knew. He has mastered this deadly game in a fundamental way and can change it as he chooses; he can construct cheats as he wishes, he can win as he wishes.

No doubt there are some who "know" computer games in such an intuitive and fundamental way. The vast majority of us don't. So what do the rest of us—about whom no one will ever say, "He is the one"—do? (Well, there are other social situations in which someone might say that you are the one, but they are not the subject of this book.) You have to do some work. That's why this book is as much about tools for you to work and create with as it is about us telling you how it is. In a very real sense "you are the one" because you're going to have to do it for yourself.

TOOLS TO THINK WITH

One way to understand the fundamentals of things is to use a theory that tries to show how something works in a simplified or abstract way. The *Concise Oxford English Dictionary* variously describes a theory as "abstract thought," "a plausible or scientifically acceptable general principle offered to explain phenomena," and "a belief policy or procedure proposed or followed as a basis for action." Theorizing is about trying to understand something by simplifying it, by abstracting away all the messy details and focusing in on a few remaining ones that we can better understand, but which still seem to capture the essence of that thing. This book uses a range of theories to try and do just that in order to better understand something of the fundamentals of computer games. Different theories can lead to different insights even into the same thing.

We use theories all the time in our everyday lives. For instance, we use theories to play computer games. Very few gamers ever read the manual. You learn a new game by playing it and in doing so you build up your own theory as to how the game works, what the underlying logic of the game is, and what you have to do to win. We are helped in this by training levels, by previous game playing experiences, and by recognizing the genre a new game belongs to. Training levels usually help out with the game's user interface and basic gameplay. They often also try to show us how to succeed. But to really know how to succeed there is nothing like real game playing experience and knowledge. This in turn leads to recognizing genres and all that comes with them; more discussion of this comes in Chapter 2.

In the very early years of computer games there were no genres. Every game was a new mystery about which every player was required to build his or her own theory in order to play it successfully.

We can express a theory in words, perhaps highly informally, as a story or a fable, for instance. We might express a theory in mathematics when it becomes highly formal. But very often theories will have models associated with them. Models are a form of analogy used to help visualize something. We can use models to help visualize theories. The *Concise Oxford English Dictionary* variously describes a model as "a representation of structure," "a summary, epitome or abstract," and "something that accurately resembles something else."

We would often express a model as a diagram, or something made out of string and cardboard, or even as a cartoon, a game, or indeed anything that allows us to visualize the theory more clearly. Computer games are themselves models. SimCity is a model that illustrates some of the complexities of urban planning. SimCity uses a relatively simple theory of urban economics that is visualized in terms of a city model. These days SimCity is actually used by economists to play "what if" games to see how their economic theories work or don't. You can replace SimCity's economic model with a more complex one of your own and play and research at the same time.

Scientific models may be more pragmatic in that they are related to some aspect of reality by means of observational data, which in turn causes the theory upon which the model is constructed to be reformulated, and so on. But doesn't that sound like what I was just saying about how we learn to play games by experimenting with them, by building up our own theory of how they work?

Theories and models have been at the heart of much of human understanding and inquiry from very ancient times. Cultures often attempt to explain the world and human beings' place in it by means of complex mythologies or etiological fables (Carruthers, 1998). Such mythologies are essentially abstractions that allow complex and inexplicable phenomena to be understood in terms of a more accessible set of characters and stories set around them. Very often the underlying explanation of natural phenomena will map onto supernatural beings and phenomena which thus replace an unfathomable cause with a commonly held narrative. These are theories explained in terms of stories and pictures, which are models of explanation. Theories can work regardless of how true they are. Better, perhaps, to feel you understand rather than be terrified by knowing you don't.

With time, more rigorous forms of theorizing were invented. The ancient Mesopotamians developed sophisticated mathematics as a technique for modeling trade involving large numbers of items and customers (Davis and Hersh, 1983). Mathematics was thus being used to build a model of trade and stock control. The ancient Greeks, and following them the Arabic world, continued to develop theories and models—mathematical and otherwise—for a variety of phenomena ranging from cosmology to music and poetry. Meter and rhyming schemes for poetry, for example, are models which facilitate the construction of new poems within established forms.

We use theories to try and express how we think bits of the world work. Some theories are very specialized and difficult; quantum mechanics, for example, can be a synonym for "difficult." Other theories are less formidable.

As we already observed, theories may also be quite instrumental in the sense that their application as an analysis technique—and the results obtained therein—may be more important than the degree to which the model accurately reflects reality. Psychoanalysis is an obvious example because no one has yet established whether the theory of psychoanalysis corresponds to the way our minds are structured and function. Yet many people have been helped by psychoanalysis.

Semiotics, the study of signs and the way people construct meaning out of them (e.g., Chandler, 2002), is perhaps another case in point because it has never been ascertained whether or not signs as defined by semioticians actually represent

structures or functions within the human brain—although there is some evidence to support this (e.g., Damasio, 1994). Nonetheless, semiotic analysis of communications artifacts—texts to semioticians—is a very valuable and general technique for gaining insights into the way in which humans communicate and make meaning using a whole range of media. Semiotics and, in particular, the semiotics of computer games is the subject of Part II of this book.

What kinds of theories and models might be useful to us in trying to investigate the fundamental nature of computer games? Many computer games already make use of some pretty heavy theory. The game engine for a driving game, for instance, will make use of various theories from physics in order to make the behavior of the vehicles appear as realistic as necessary. The math for friction, torque, suspension systems, acceleration, deceleration, and much more will all be embedded into the program code. We have already noted the role economic theory plays in SimCity and it is fairly obvious the roles ballistics and models of explosions play in the much-maligned *first-person shooter*. (In the rest of the book genres will be written in italics, as in *beat-'em-up*.)

Many of the very early games were in fact models of a particular theory: inertial physics for early space games, dynamics for the bouncing balls in Pong and Breakout, and basic artificial intelligence theories for nonplayable characters as diverse as the Ghosts in PacMan and the people that Ryo Hazuki meets in Shenmue. Such theories are at the heart of just about every game you could think of. Even Tetris has a simplistic notion of gravity coupled with a basic theory of the way right-angled objects fit together.

But these are not the kinds of theory we need to use to investigate games. Understanding how the theory of gravity works in a game doesn't help you understand why the game does or doesn't work for its players. We need to understand the very nature of gameplay, the kinds of pleasures people experience in playing games, the reasons why people recognize a bunch of flickering pixels and digitized sounds as a realistic world in which we can get frightened or feel elated, and, most importantly, why we are so willing to devote so many hours of our lives to such artificial deceptions.

So there are theories we program into games. More importantly for us, are there also theories that can help us to probe into the nature of games, which will allow us to establish general principles of games? The answer is yes and no. There are such theories but computer games are developing so quickly that our fundamental understanding of them lags behind our ability to build them. Coming to understand computer games is very much a research topic. Much of what is in this book is based on current or recent research. Contemporary computer games are also very complex entities and no single, simple theory is going to describe them. Not even a whole bunch of theories is going to do that. Despite this we are going to try to do just that.

Let us say a few words about our approach to theory. All the theories in this book are holistic in the sense that they all apply to the whole game and not bits and pieces of it. We won't just study the game's internal economy or the interface; we'll study the game as whole. In the early chapters our theories won't be that deep but they will be useful. As the book develops the theories will get more complex, but

because we're using holistic theories we can put them all together to form an integrated DIY analysis kit that looks at games from a variety of levels and from a variety of viewpoints; but they'll still all work together.

We can do several useful things with this DIY package. For one thing, we can go big game hunting! We can look at big games like Shenmue and SimCity and see how they tick. No game will be too big for us. We can also use the package to try and define games more clearly. At the beginning of the book the only definition I use for computer game is that they are things that people call games that are played on computers, consoles, handhelds, arcade machines, and so on. That's a really sloppy definition but it makes sure we don't exclude anything because we used the wrong definition. We'll return to this toward the end of the book. Another thing we can do is to use our package to think about game design and the creation of new gameplay ideas. There will also be a lot of tasks for you to do to practice your mastery of all this as the book progresses.

GETTING STARTED

Despite their having been around for some forty years or so, computer games are still an emerging art form. This means of course that what we are trying to understand keeps changing, keeps diversifying, keeps evolving before our eyes. Janet Murray discusses the implications of this in her excellent book on using interactive digital media, such as computer games and the World Wide Web, to create interactive stories (Murray, 1997). It is worth noting some of her observations on the emergence of new media in general. She identifies three stages in the emergence of a new medium.

1. **The Embryonic Medium**. People anticipate the new medium prior to the technology itself being available to support it.
2. **The Incunabula Medium**. The technology becomes available, in part at least, but people are still learning how to create specifically for it.
3. **The Fully Fledged Medium**. New forms arise that are specific to the medium and make best use of its capabilities.

Interactive digital media are mostly in the incunabula stage. We have the technology and have had it for some years now. We are still very much in the process of learning how to use it for what it is and creating specifically for it. It could well be argued that computer games are moving to being a fully fledged medium because of the fact that we have forms specific to the medium and some of these forms are quite mature. The *first-person shooter* could be considered a mature form. There are other genres which are still at the incunabula stage and others that have still to emerge, if indeed they ever do. Virtual storytelling—using computer games to tell stories—is currently the subject of much research and debate: it is most definitely incunabula but might never become fully fledged.

This highlights one of the problems. The fact that interactive media, such as computer games, are mostly still in their incunabula stage means we can't yet see exactly what we are trying to characterize and understand. Murray sees this as the

passage from additive to expressive form, meaning that in the beginning of the incunabula stage we use the new medium as a simple extension of existing forms. As we become more familiar with its possibilities we find new forms that allow us to express ourselves in ways that previous media did not allow. To understand this is to understand why computer games are so interesting to study right now. Hopefully, it also leads the reader to understand why this book has an edge to it and why it sometimes seems to pose more questions than it answers.

Before we begin the book proper let's take a closer look at a theory and a model and the practical relationship between them. Let's look at something really straightforward: storyboards. We are going to look at the theory of storyboards because I imagine just about everyone who has anything to do with games design has come across, created, or worked with or from storyboards at some time or other. Storyboards are easy to understand—they give you the outline of a story—but require good drafting skills to make well. They are a way of communicating the main points in a story in a cheap and easy way. They can be easily changed and updated and don't require any expensive or time-consuming technology. They also have nothing to do with theories and models, right?

Storyboards work because they enable us to visualize a very complex entity such as an entire feature film before anyone has even decided to make it, before it even exists. Yet from a good storyboard we can get a pretty good idea of what the film might be like to watch. Storyboards are an abstraction, a summary; a representation of structure, characters, events, moods, camera angles, lighting and, no doubt, much more; all this in a few little hand-drawn pictures. Yet feature films are photographed at 24 frames a second, rely heavily on sound and music and are highly dynamic; they change over time. Sound and music *only* work because they change over time. Visually, films are also highly dynamic: the characters move; the camera moves; the focus changes; cars, trains, clouds all move; the lighting changes; the film jumps from one scene to another; and so on. Yet storyboards still work. Why?

Storyboards provide a useful model of what a feature film is all about. Underlying this model is a theory concerning the nature of feature films. What might this theory be and what is the real relationship between a storyboard and the actual film it models?

In Figure 1.2 you can see an excerpt from the storyboard for "Timmy's Lessons in Nature" by Mark Simon. Without knowing the story you'll quickly see that you should read the storyboard in rows: top row first, left to right; second row next, left to right; and so on. You'll also quickly get the basic story. Timmy, the main character, is swinging through the trees of a great forest using a large snake as a rope. The snake isn't too happy about this and bites Timmy's head who then can't see where he's going. All this is being watched with great interest by a wily predator. Eventually the snake can no longer support the both the weight of Timmy and itself and crashes to the ground and is pounced on by the predator; Timmy escapes and his adventure continues.

We "read" this storyboard almost as if we are actually watching the finished cartoon. And yet all we have is a series of outline pencil drawings. The storyboard is a model of the cartoon and could of course be used to refine it and as a design

Figure 1.2   (Courtesy of Mark Simon, Animatics and Storyboards Inc., http://www.storyboards-east.com/about.htm.)

guide to produce it. But what is the underlying theory? What form of abstraction is involved here?

The theory espoused by the storyboard is very much to do with assumptions that can be made about the way people watch and make sense of films. "Timmy's Lessons in Nature" is a comic animation, meaning that it belongs to the cartoon genre of films, and thus has certain conventions to do with theme, story, lighting, and so on. One of the many, well known conventions of the genre is that not only are strange, unusual things likely to happen but that reversals of fortune occur very frequently for all the characters involved. The storyboard conveys this very well but it also relies on the idea that, knowing the rules of film and of the cartoon genre in particular, we can actually take a single, hand drawn image and produce the whole clip in our minds.

Each picture in the storyboard stands in for a complete film clip and we use our imaginations and knowledge of the language of film to make it real in our minds. The storyboard thus emphasizes the sequence of dramatic events that happen to the three characters in question. In other words, the way dramatic tension is controlled through the editing together of film clips is taken as the most important detail to be abstracted. If the storyboard is well constructed we can imagine a highly complex sequence of filmic/cartoon events with a great degree of precision.

Not all storyboards work in exactly this way, of course. There are other features of films we can abstract out of films: action sequences or long tracking or panning shots, for example. Storyboards will often also be annotated to bring in additional information to do with dialogue, lighting, musical score and sound effects, and so on. There are a lot of details relevant to a film which cannot easily be represented in static images.

Notice in the example above how many times an arrow is added to the image representing each clip. Cartoons and film in general are about action. In rows one and two, the arrows represent direction of a character. In row three, the arrows represent the "camera" panning upwards to the branch the snake is trying to hold on to. By using the nonfilmic device of an arrow to indicate directions of movement, the idea of one image for each clip/sequence of film can be preserved. We don't have to be told that the arrow won't appear in the finished cartoon. We know how to read the storyboard and "view" it in our minds eye as a cartoon sequence.

To summarize, we can observe that even something as apparently simple as the humble storyboard is based on the twin notions of theory and model. The modeling aspect of storyboarding allows us to visualize a complex entity such as a cartoon or feature film in terms of a few salient features. Underlying the model is the theory that from simple static images, people can imagine complex sequences of film because they are familiar with the language of film, the way films are photographed and lit, the way they are edited, and so on.

Interestingly, one of the reasons why this particular storyboard works so well is that it is easily recognizable as belonging to the cartoon genre, which in turn means that we are able to employ more specific knowledge of this particular type of content in our imaginings. In the next chapter we will make a study of genre theory and

models based on it as our first attempt to find out more about the fundamental nature of computer games.

SUMMARY

Storyboards are also used in the design of computer games but with less success due to fact that games introduce interaction which, in turn, means that the diverging consequences of interaction must be conveyed somehow. This means some form of branching storyboard or complex annotations which show where in the storyboard to jump to if a certain intervention is made. This can work to a certain extent for *point-and-click* games such as the Monkey Island series, but for *first-person shooters* and most other game genres, storyboarding just isn't up to the job. This is because there is no predefined story to branch; the player intervenes whenever they want. But that is interesting in itself. The fact that storyboards as theory and model are not really appropriate for designing and are certainly not appropriate for analyzing games already tells us that there must be major differences between films and games. This reinforces the notion that we would seem to need particular theories and there-fore particular models in order to understand the fundamentals of computer games.

Before we get on with the book proper let me just summarize a few of the points made in this introduction and add one or two more:

- This is a book that attempts to understand the fundamental nature of computer games;
- It uses a variety of models and theories to achieve this;
- It is concerned with the look, feel, and gameplay of games, not with how to program them;
- We won't just look at new games. Many of the games will be quite old;
- The theories are going to get more complex as the book progresses;
- This means you, the reader, will have to put in some effort;
- We'll go on to use our theories and the insights they enable to define games more rigorously and to think about game design as well.

Time to get going . . .

Chapter 2

Genre

Computer game publishers, game magazines, game review sites on the web, any text that discusses games, and millions of players around the world all love to put games in genres. You come across genre labeling all the time: games are shelved in shops by genres, and magazines label games in this way throughout their pages. It seems as if games have to belong to a genre.

It might seem that genres are the idiosyncratic manufacture of game reviewers and the marketing departments of publishers. This of course does happen on a regular basis and we found 389 genre names in current use, either frequently or spasmodically, by professional online game reviewers alone. But for a genre to become established as part of popular game culture it needs to go through a process of cultural acceptance so that all participants in a particular subculture—the players and industry professionals in this case—reach a collective agreement.

This collective conventionalization of genres is part of the general cultural and social construction of meaning systems; systems which allow us to understand and create within complex and often abstract communications systems that humans constantly invent and update. Computer games are just one example of such systems. So to better understand computer games, and for a number of other reasons which will become apparent as this chapter develops, genres are very interesting to study. But the foremost reason for starting our investigation into games with a discussion of game genres is the clear relationship genres have to the game development and publishing industry itself. We start where it starts; or rather, we start where the industry has gotten itself so far.

If you are a *first-person shooter* (FPS) fan then you will most likely be happy to play a new game loosely classified within that genre. You will find that the controls for the new game will be much the same as for other games of that type. You will use the same keyboard keys; WSAD to move and left mouse button to fire on the PC, for example, and similar control pad buttons to pick up and discard objects, and if there are differences they will be slight and easy to work out for players adept in the genre.

13

Genres are also one of the ways players can demonstrate that they are part of the computer gaming world. If you know what *MMORPG*[1] or *RTS*[2] stand for then you're on your way. Game players themselves are pretty obsessed with genres in other ways too. Many students in Clive's Games Futures class only played games from a small number of, often closely related, genres by choice; but they would recognize and be able to name games from many more. For the people who distribute and market games this seems great. Put a game in a genre and an established body of fans are ready and willing to try the game out just because it's in a genre they love.

Of course one of the big complaints about genres is that they constrain publishers and make it difficult for new types of games and styles of gameplay to emerge. There are also other problems cited for genres.

Sometimes genres don't seem to be quite as straightforward as players or the industry would like. Wreckless: The Yakuza Missions is a driving game, right? But Wreckless: The Yakuza Missions and Colin McRae Rally 2005 seem quite different despite the fact that you have to drive in both of them. They are very different games despite being in the same genre. How can that be? Maybe there is more to a *driving* game than driving. We'll take a closer look at the *driving* genre later.

Perhaps we have become anesthetized to the notion of genre and have come to view it as some kind of marketing-speak that in the end is not very useful. But that does not have to be the case. There is a whole field of genre theory devoted to a wide range of communications media which attempts to understand what genres are and therefore the media themselves. Genre theory will be the first of the theories we study and apply to computer games.

WHAT ARE GENRES?

The word "genre" comes from the French for "kind" and was used to refer to particular types of poetry, prose, and drama. Drama could then be classified as comedy or tragedy, for instance. Shakespeare referred satirically to classifications as "tragedy, comedy, history, pastoral, pastoral-comical, historical-pastoral, tragical-historical, tragical-comical-historical-pastoral . . ." (*Hamlet*, act 2, scene 2). The joke is well made but it also might give us an insight into the nature of genres. Is it possible to invent a completely new genre that doesn't draw on an existing one? Can we find an instance in the history of the feature film, for instance, where a film was made which was then identified as being the first ever in a new genre? Or do new genres always adapt or amalgamate existing ones? In an established medium such as film, the latter is almost certainly the case these days. In the early days of film the former might have been possible.

Maybe games are new enough as a medium that new genres can still be invented. The *rhythm action* genre is perhaps the newest major genre to emerge from the games industry; a genre that is enabled, in some cases, by peripheral technology.

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[1] Massively multiplayer online role playing game.

[2] Real-time strategy.

Perhaps platforms such as the Nintendo Wii and the Xbox 360 Kinect system will make it easier to create new game genres, or will they simply be used to adapt existing ones?

We use genres extensively in everyday life. Research has shown that young children very soon learn to use genres in their conversations about the world around them (Jaglom and Gardner, 1981). Film and TV guides use genres extensively. The vast majority of us would have a pretty clear idea whether a film we were watching for the first time should be classified as a western, or a comedy, or a romantic-comedy, or a romantic-comedy-western; sounds familiar, doesn't it. This also goes for TV programs that are new to us; most of us would have a clear idea of what a game show, a sitcom, or a soap opera should be like. What about reality TV as a TV genre? If reality TV is a TV genre, then what characterizes it?

Genres are a pretty powerful form of abstraction. They are a form of theory we employ in everyday life on a constantly recurring basis. So the first thing about genre is that it is a great example of a theory that we all use easily and understand in our everyday lives. It is no surprise then that we have come to use genres to classify games.

So, if it's so easy and natural to use genres as a way of making sense of the mass of media surrounding us, it should be easy to define them? Now the trouble starts. Let's further consider film genres. How do you define the "western" genre in feature films? You might say, all the films about cowboys. But there are films about cowboys that are not westerns. *The Horse Whisperer* and *Midnight Cowboy* are just two examples of many that come to my mind. I am sure you can think of your own.

We can try to refine our definition. Westerns are about cowboys, in the nineteenth century, in the United States. But lots of westerns aren't about cowboys. They might be about building railroads, crossing and settling the Great Plains, wars between settlers and Native Americans, and so on. In fact, most characters in westerns aren't cowboys at all.

The real point here is that we easily recognize genres but find it very difficult to define them. This is almost certainly because genres are just one example of the way our brains make sense of the world by finding patterns in the overload of stimuli that bombard us all in every waking moment. The pattern matching part of genres is not something that involves rational and conscious thought. This means that while we can work with genres and pretty easily identify examples of films that belong to them, most of the time we don't actually know how we do it.

There is more to it than this. We have chosen the type of genres you might find in a TV film guide but there are other classifications for films that we would readily recognize as film genres. There is the "Hollywood" genre as opposed to "art movies" and "Bollywood," for instance. This type of genre classification is not based on a theme or story type but on particular ways of making films. It means that the same film can be in several different genres. It all depends on your purpose in categorizing them. Not only are genres easy to recognize but difficult to define, they are also very much dependent on who is using the genre and what their purpose is in doing so. In film or in computer games, the genres we recognize and use were not just invented by a single person. They arise from a sort of dialogue that happens between people

who make games and people who are entertained by them. The film genres most of us are familiar with have arisen over time by directors and critics using them and the film-going public accepting some and not others. So the fact that genres are a social construction is not a weakness but a strength. It means that genres in common use have a social value and are not just the arbitrary invention of a critic, well meaning or otherwise. In other words, the genres we recognize and use say something about how cultures view particular types of communications media. Therefore, game genres are fully rooted in culture and are not just marketing spin.

There are other strengths of genres. Despite the fact that they seem difficult to define in any rigorous sense there are some general principles we can establish for them. They are about both repetition and difference. It is the repetition of known features that allows us to establish which genre a film belongs to but it is the way that particular film differs from others in the same genre that makes it worth watching. It has to have the right type of things in common but has to be different in other respects. A film can't just be a copy. It has to be different enough to be worth watching. *Jurassic Park* and its two sequels were so alike as to be more or less the same film, not just the same genre, and, to some of us, the sequels are less watchable for that very reason.

So when categorizing a film in terms of genre it is how that film differs from other films in the same genre that is perhaps most interesting about it, rather than the similarities it shares with them. And yet, to make sense of a particular type of action sequence, for example, we need to recognize it in terms of all the others we have seen.

In a film, we would all recognize the rescue sequence with alternating clips of, for instance, the cowboy on his galloping horse, the heroine clinging to a branch hanging over a cliff or waterfall. It only makes sense because we associate the cowboy's haste with the heroine's predicament. We don't see the two scenes as being entirely separate. We instantly recognize this type of rescue scene because it is part of a general theory of film that we have learned over the years. This is not even specific to westerns. We recognize the type of scene but would expect all such rescue scenes to be different but similar. It's part of the language of feature films.

The balance between repetition and difference in game genres is vital to game developers and players alike. It is one of the things we are going to try to use genre theory to identify. Although genres are so elusive in terms of definition we can still make good use of them.

WHAT ARE GENRES FOR?

Studying the genres people recognize can lead to insights concerning how they view a particular communications medium and what is important to them. Every genre positions those who participate in a particular medium as listener, reader, viewer, user, or player, each implying different possibilities for response and for action. Each genre provides a reader/player position for those who participate, a position constructed by the maker for the "ideal" reader or user. Computer games can do this

very well (good games, that is). Part of the pleasure of games is that users feel they fit snugly into the "ideal player" position, as if the game developers had each one of them specifically in mind when they made it.

Such systems of genres can be seen as a practical way to help those who work in any mass medium to produce new content consistently and efficiently and to relate this production to the expectations of customers and users. Since the genre system is also a practical device for enabling individual media users to plan their choices, it can be considered as a mechanism for ordering the relations between the two main parties to mass communication: in our case, developers and players.

Recognizing a film as belonging to a particular genre identifies the viewer with other people who know enough about films to assign genres to them. The same is true with computer games genres; probably more so. Almost everyone watches films on TV even if they don't go to the cinema. Fewer people play computer games and one way of identifying yourself as a member of this more select grouping is to know and use genres appropriately. One of the pleasures of game playing is being adept at particular genres. This has more significance to games and gamers than with many other communications media because to be fully adept with a game genre means you have to have certain skills and knowledge particular to it. Anyone can watch a film but you have to develop skills to play particular games effectively. Because of this, knowing and using game genres effectively acts as a sort of badge of membership of the games community.

In a straw poll conducted among Clive's Games Futures students we asked everyone to put up their hand if they felt adept at one game genre. Not surprisingly, everyone put a hand up. We asked people to keep their hand up if they played games from two genres, then three, then four, five, six seven, eight, nine . . . by nine or ten we stopped the survey because no one still had a hand up. After six or seven the number of hands fell away dramatically. People seemed happy with up to about six or seven genres. Compare that to the genre map of TV films, and the picture is quite different. Although many people would have a number of favorite film genres almost everyone would be able to recognize and watch films in all the genres. With computer games, all the class would be able to recognize most if not all genres if they saw someone else playing them or saw them advertised on the television. But they only see themselves as adept at games from a relatively small number of genres. What does this tell us about game genres and can we use this to our advantage? Can this observation lead to a theory of game genres that will in turn lead to some insight into the nature of games? Yes, because the difference between recognizing a game genre and being an adept in it makes games genres very different from film genres.

As we already pointed out, a game genre will posit an "ideal player" and many players are happy to be able to recognize themselves as that ideal player. By choosing to play a particular game we are identifying ourselves with the kind of person the game maker was designing the game for. I believe the link between game developer and player is far more potent than the link between film director and film viewer. I don't need new skills to watch a film from an unfamiliar genre but I certainly do to play a game in a genre I am unfamiliar with for the first time. It's our first clue on the road to understanding games.

GENRE MAPS

Before looking at computer game genres in detail, here is a technique we can make use of. For a given communications medium we can build up a genre map which charts the relationship between the main genres of a particular medium. Figure 2.1 is a map of film genres as found in TV listings magazines in 1993 (Chandler, 1997). It lists the genres of films that would be shared by film critics and TV viewers.
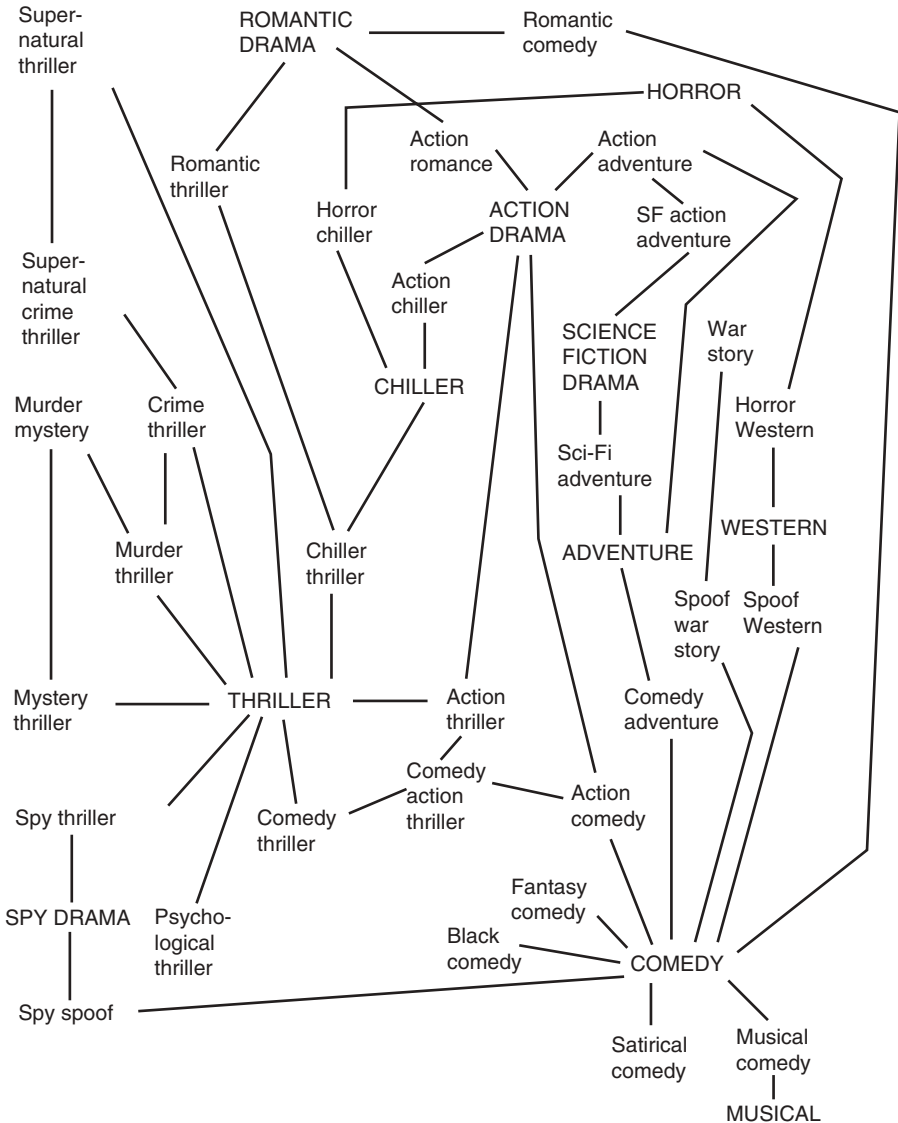
Figure 2.1   Film genre map. (Courtesy of Daniel Chandler, Aberystwyth University.)

An important point about the genres that make up the map is that they are not just made up but drawn from actual TV film running schedules, so are socially recognized genres. Consider for a moment the nature of the genres represented in the map. The categorization implicit in the map is based on the notion of content, on the type of story being told and the conventions concerning the way the film should be made. The former relates to particular character types and plots while the latter are to do with the photography, lighting conventions, and so on that go with them.

The map also illustrates the point we made earlier about genres, and how new ones are made from existing ones. In other words, we can take the "science fiction" and "comedy" genres and make up a new one of "science fiction comedy" of which there are actually many examples (even though this genre does not appear in the map). No genre map such as this will ever be complete. There will always be films we had forgotten about or which haven't been made yet. But as with genres in general, the genre map for a given communications medium can be a very useful tool. In fact, the genre map is a model, an approximation which helps us to visualize the theory of genres at work. There are things the model misses and maybe even gets wrong but it is useful nevertheless.

It's actually quite difficult to work out what the underlying theory for this model is. Is it story type, or styles of camera work and lighting and acting? It is most likely a combination of all these and more. Again, we see how we understand and make use of the genre model without knowing exactly what the underlying theory is. Are game genres as elusive? If you take a look at a typical discussion, such as the one at Wikipedia (Game Genres) you would think so; but we know different.

COMPUTER GAME GENRES

We can try to build up a similar map for computer games genres by simply making a list of all the named genres we can find in, say, the online magazine IGN.com, and then working out the relationships between them; in other words, what genres appear closely related. Presumably we would end up with a similar map to the film one above. In fact, this is what we tried to do in my Games Futures classes. Making the list wasn't too difficult but it wasn't always easy to agree what was an "official" genre and what was not. It was all too tempting to just add in a genre or two of your own.

So what genres does the game industry recognize? Table 2.1 shows a fairly typical list of genres used by major game review sites. Most of the genres included seem reasonable but there are one or two oddities. For instance, *racing* is there but *driving* is not; not all *drivers* are *racers* nor are all *racers drivers*. *Sneak-'em-ups* are not mentioned, as are not a number of other genres we'll use in this book. We're sure you can all think of other omissions and anomalies.

Now here are a couple of lists of game genres drawn up by people in the industry. First of all, we will include Steven Poole's list of game genres from chapter 2 of his excellent book *Trigger Happy* (2004), which, incidentally, was the set book for the Games Futures module before we wrote this one; his genres are:

Table 2.1 Game Genres

Action	Action adventure	Action card	Action compilation
Action RPG	Action simulation	Adventure	Adventure compilation
Battle	Board	Board compilation	Card
Card battle	Card compilation	Card RPG	Casino
Casino compilation	Comp	Educational	Educational action
Educational adventure	Educational productivity	Educational puzzle	Educational trivia
Fighting	Fighting action	Fighting editor	Fighting simulation
Flight	Flight action	Flight simulation	Hunting
Hunting compilation	Hunting simulation	Music	Music action
Music editor	Other	Other action	Other adventure
Other card	Other productivity	Other puzzle	Other RPG
Other racing	Other sports	Party	Pinball
Platformer	Productivity	Puzzle	Puzzle action
Puzzle adventure	Puzzle compilation	Puzzle word games	RPG
RPG compilation	RPG editor	Racing	Racing action
Racing editor	Racing shooter	Racing simulation	Sampler
Shooter	Simulation	Sports	Sports action
Sports compilation	Sports editor	Sports simulation	Strategy
Strategy compilation	Strategy RPG	Trivia	Video
Virtual pet	Wrestling	Wrestling action	Wrestling simulation

- Shoot-'em-ups
- Drivers
- Platform
- Beat-'em-ups
- God games
- RTS
- Sports
- RPG
- Puzzles

Andrew Rollings and Ernest Adams, in their equally excellent book on game design (2003), discuss the following genres in some depth:

- Action
- Strategy
- Role-playing
- Sports

- Vehicle simulations
- Construction and management games
- Adventure games
- Artificial life, puzzle games, and other genres
- Online games

The games "press" as a whole seem to recognize a lot more genres than these two writers on games. Why should this be so? The main reason is that the press is largely concerned with the way games are marketed and sold. Most games are designed to be in a particular genre because that is a major part of the way they will be reviewed and thus feed sales through to the major, mostly online, retailers. On the other hand, the game writers are trying to make some sense out of all these genres and whittle them down to a small, manageable set that seem coherent for the purposes of discussion and capture something of the nature of games. Is there a way we can make some useful sense out of all this?

A THEORY OF COMPUTER GAME GENRES

We already noted an apparent difference between TV film genres and game genres. People were able to watch any number of film genres but were only adept at playing a few, typically six or seven, game genres. It is easy to see that this is because of the investment in knowledge and in particular skills that is required in order to become adept at a particular game. Very often being such an adept makes it fairly easy to play other games in the same genre. You will recognize the underlying logic of the game, how to progress and win. The interface will most likely be very similar, even down to the keyboard or game pad controls, and so on. Game genres are different from film genres.

The kind of map we saw for TV film genres, Figure 2.1, did not appear to exist for games. Trying to build such maps begins to make the difference between game and film genres clearer. In Clive's Games Futures classes building a genre map for games was one of the initial tasks for students. Figure 2.2 is a synthesis of some of the maps built by students and uses some of the genres they suggested. This one is much simplified but does exhibit some of the general ideas and some of the main problems encountered.

We should emphasizes that there is no correct genre map for computer games, but that certainly doesn't mean that trying to make one isn't interesting and useful because it certainly is.

You will find many of the genres in this map used by the games press, but student maps typically included far more genres than even the games press commonly uses. One of the reasons for this is that Clive did not require the students who constructed these genre maps to restrict themselves just to genres cited in published media. They created genres of their own to best reflect the way they categorized computer games. This led to much discussion concerning whether or not some of the entries in their maps were actually genres at all.
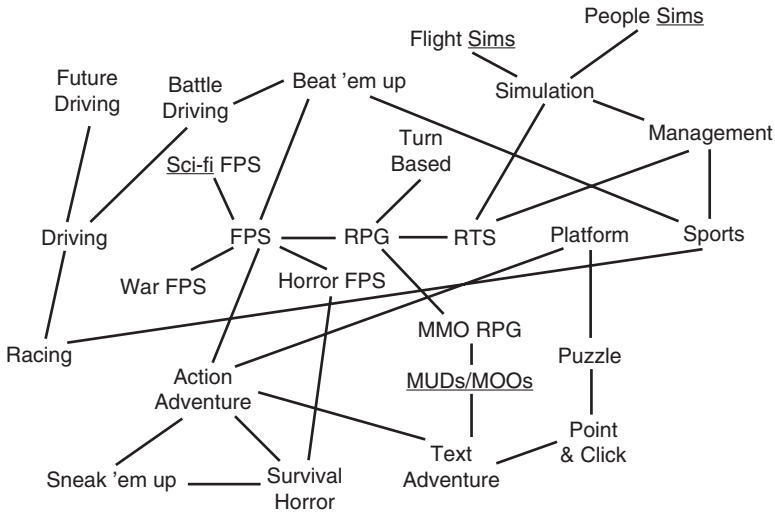
Figure 2.2   Genre map for games.

Looking at Figure 2.2 we might question the difference between *horror–FPS* and *survival–horror*. The latter is a recognized subgenre of action adventure but the former is an invention. Similarly, we could ask, are the two genres *war–FPS* and *future–FPS* from the map of game genres at all? We came to the conclusion that these were more like film genres and were just instances of *FPS* in general. So what is the difference?

Film genres are all to do with the type of story the film is based around and along with such stories come ideas about the style of lighting, camerawork, and a host of other things. Game genres are all concerned with activity: what does the player actually do in order to progress the game? This is why *future–FPS* and *war–FPS* are not actually game genres because the gameplay would be almost identical, and exactly what you would do in an *FPS* in general.

Here is an easy way to focus in on game genres. Pick a game genre or three—preferably ones closely related to one another as on one of the genre maps above—and try to write down a few verbs (six or so) which appear to capture the main activities which characterize the genre. In particular write down "doing words," present participles, that attempt to characterize what you can expect to be doing at any one moment in a game of a given genre. This seems to break the rule we stated earlier that genres are easy to recognize but hard to define. Well, the idea here is not to define computer game genres precisely—we'll do that in the next chapter—but rather to build a model that gives us some insights into the nature of these genres and thus, perhaps, the nature of computer games themselves.

Table 2.2 lists a range of game genres and the present participles associated with them. Basically, we have put forward a theory that activity characterizes game genres. Not all of the "ings" are action words; some are thought and emotion type

Table 2.2   A Basic Set of Genres

Genre	Activities
FPS	Shooting, killing, moving, collecting, ambushing, camping
Stealth	Shooting, moving, attacking, collecting, waiting, hiding, puzzle solving, sneaking
3D adventure	Moving, puzzle solving, collecting, speaking
Point and click	Moving, puzzle solving, collecting, speaking
Platform	Moving (scrolling), jumping over, jumping on (killing), avoiding, puzzle solving
RPG	Fighting, developing/training, exploring, traveling, investigating, story building, empathizing (with character)
Beat-'em-up	Fighting, tactics, countering, making moves
RTS	Building, commanding, fighting, planning, scouting, collecting (money, wood, etc.)
Driving	Steering, accelerating/decelerating, overtaking, avoiding, skidding, cornering, maneuvering, making pit stops, crashing
God games	Building, planning, strategizing, predicting
Retro	(No common activity words)

words. Thinking and feeling are just as much central to game activities as more obvious actions. They are all at the heart of the pleasure of game playing and will lead us into the subject of aesthetics (in Chapter 4).

However, for the moment we are interested in the way different gameplay activity profiles, that is, patterns of activity, not only characterize genres but also allow us to compare and contrast games in new ways. We can begin to make some interesting observations about certain game genres and the relationships individual games have with them. We already saw how this theory of game genres allows us to eliminate some of the instances in Figure 2.2 because they didn't have distinct sets of activities. You should be able to go through the diagrams and eliminate or, rather, amalgamate more genres.

It is very interesting to consider the links between genres. Take a look at the links around the *puzzle* genre in Figure 2.2. Are we happy about these, for they would seem to imply a very strong link between *puzzle* and *platform*, *action adventure*, *point and click*, and *text adventure*? The problem here is the *puzzle* genre at the center of the relationship. All of these games have puzzling as a major activity but puzzle games are a lot simpler than the other four; there is a confusion between activity and genre.

The other four do cohere in terms of activity, particularly *action adventure* and *platform*, then *text adventure* and *point and click*, but all are realized in differing gameplay modes.

Notice there is no link between *action adventure* and *RPG* although there is a strong link between these two genres, particularly with games like Fable: The Lost

Chapters. Basically, an *RPG* is an *action adventure* with significant character development skill enhancement as gameplay activities.

A further question: did *RPGs* evolve from from *text-adventure* as Figure 2.2 would seem to suggest? After *text-adventure* there were *MUDs*[3] and *MOOs*[4]; the latter having significant character development—along with other forms of development—and both were certainly very influential on today's *MMORPGs*, the temporal incarnations really differing on gameplay modes more than activity sets.

Other links in this vicinity would not seem to be quite as strong. That between *RPG* and *RTS*, for instance, does not seem right. The links between *RPG* and its various sub-genres do seem fair. It also seems clear that closely related genres on the map can have significantly different gameplay; *sneak-'em-up/stealth* and *FPS* are good examples of this.

The *retro* or *classic* genre doesn't have any common activity words. It is not a genre in this classification. It could possibly be a genre if we were looking at genres concerned with the development of games over time, but not based on gameplay. However, characterizing some *retro* games can be interesting; for instance, "genre-ing" Lemmings puts it in the *RTS* genre, and it is therefore the ancestor of all *RTS* games.

We can also observe that genres evolve over time—genres as memes[5]—and this is clear if we observe the changing names of common genres. When Thief and similar games were first released they were termed *sneak-'em-ups* by the games press and the term was recognized and used by game players. Such games are now referred to as *stealth* games and the term *sneak-'em-up* seems to be largely forgotten and indeed unrecognized by younger players.

We can begin to think about subgenres. If you list a set of activities for a typical *survival horror* game such as Resident Evil 4 and an *RPG action adventure* game such as The Legend of Zelda: Twilight Princess, you will find the activities are much the same; it is the back-story that is distinct to Resident Evil and the addition of *RPG* elements that characterizes this version of Zelda. Perhaps game subgenres are about limited variations in either activity profiles or differences in other things such as back-story, rendering style, and so on.

It is interesting to look at another *action adventure* game in terms of genre to illustrate that genres are not as straightforward as the previous table would seem to suggest. As an *action adventure* game, Shenmue will indeed be characterized by the verbs exploring, puzzling, traveling, investigating, and so on, but it is also characterized by developing/training and high levels of confronting which are characteristic of *RPG*; in other words, genre-mixing. But at various stages in the game the genre switches to *driver* or *beat-'em-up*, among others. In this game we have differing activities to undertake at different stages in the game. Such genre switches mean

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[3] Multi-user dungeon.

[4] MUD-object orientated.

[5] This refers to cultural evolution of a classification over time.

that we can only fight people when it is appropriate to the story line. In Shenmue this is more than reasonable as it prevents us fighting old ladies and other innocent citizens who just happen to be passing while we are exploring or investigating. So Shenmue as an *action adventure* mixes in elements of *RPG* but is also a multi-genre game and employs genre-switching to vary the types of activity, the gameplay mode, required of the player at particular stages in the game.

Now let's look at the *driving* genre and see how identifying the activities that characterize such games will lead us to new insights about this popular genre. Take the two games Wreckless: The Yakuza Missions and Colin McRae Rally 2005. They are obviously both *drivers*. The main activity is driving fast vehicles. But they are quite different games. In Wreckless we play either a spy or a police officer attempting to bring down the head of the Yakuza in Hong Kong. As the name suggests, the player's objective is to thwart various Yakuza bosses by wrecking their transportation using the playable vehicle. This is not its only feature; it also includes *strategy* and *action adventure* activities in particular missions. For example, one case requires the player to rescue a hostage from a massive dump truck, but this cannot be done by simply ramming the vehicle. The player has to detonate explosive barrels the truck is carrying by launching the playable vehicle off various points around the construction site.

The verbs that describe this game are investigating, planning, and attacking, but these belong to the *RTS* genre and certainly don't apply to Colin McRae Rally 2005. This is much more of a rally simulation and requires great driving skill on all sorts of terrains, following a codriver's routing instructions, working within time constraints, and all sorts of other skills that belong to rally driving.

We have two *drivers* that have some of the same verbs but one, Wreckless, has some from another genre. Wreckless is a kind of *strategy* game, a *driving–strategy* perhaps? Perhaps the *driving* genre is really some kind of meta-genre in which we have the basic activity type of driving but to which can be added other activity types to arrive at specializations of it. Think of other drivers and see what specializations might apply to them: some are *beat-'em-up–drivers*, some are *stealth–drivers*, *RPG–drivers*, and so on.

The *driver* genre is indeed a meta-genre. Rollings and Adams have an even more inclusive meta-genre called *vehicle-simulations* which would include *flight-sims*, *boat-sims*, *ship-sims*, *train-sims* and many more. Some of the games in the *retro* or *classic* genre, Lunar Lander for instance, can also belong in this genre.

SUMMARY

Genres are helpful and confusing all at the same time. Writers on games seem to want/need to adopt fewer, more generic genres in order to make sense of games as a phenomenon. It may well be that there is a trend here that has something to do with the evolution of games over time. In the beginning there were no genres. There was only a small number of games, most of which looked very different. As more games appeared you could perhaps begin to classify them: *spaceship*

games, *collect-'em-ups*, and so on. Perhaps the first real genre was *text adventure*; but after that came the *platform* genre and suddenly everything before that was *retro* or *classic*. *Platform* was the first recognizable genre for graphics-based games. Now, with hindsight and a little genre analysis, we can see that even *classic* and *retro* games mostly belong to currently recognizable genres and that *platform* may well be an instance of *adventure* constrained by the technology of its time.

In games, gameplay activity is king! So, instead of starting with the genres the games press use, why not start with a small number of activities and classify games according to the patterns of activity that are important to them. We have done just this in an informal way in this chapter but even so have come up with some interesting insights into the nature of games by analyzing genres. We considered:

- Genre-linking through common gameplay activities, giving us insights into the nature of genres themselves and the relationships between them;
- The relationships between games both current and historical despite their having differences in gameplay modes or enhancements in technology;
- Subgenres and some rules that govern them;
- Genre-mixing to produce variations on a genre or indeed new genres altogether;
- Multigenre games employing genre switching, such as Shemmue; and
- Meta-genres where a key activity or small set of activities identifies a set of games which otherwise have differing activities.

In the next chapter we are going to pick up on these ideas and develop a more practical approach by using software to analyze gameplay activities, allowing us to work with games and their genres in a far more rigorous manner and in far greater numbers.

FURTHER READING AND TASKS

If you would like to follow up on genre theory and discussions of game genres then here are a few starting points. The best introduction to genre theory I have found is Daniel Chandler's *An Introduction to Genre Theory* (1997) which is part of his excellent "Semiotics for Beginners" site which we will be referring to again in Part II of this book. Good discussion of game genres, but not from a genre theoretic point of view, can be found in Steven Poole's excellent *Trigger Happy* (2004, p. 29) and the whole of part II of Andrew Rollings and Ernest Adams' excellent book (2007).

Here are some tasks to try for yourself:

1. An interesting exercise is to try spotting a new genre by adding an "ing" word for gameplay activity to an existing game or genre, and then seeing how the gameplay would change.

2. Try taking some classic, retro games from the era before genres—games such as Spacewar, Lunar Lander, and PacMan—and see what genre you think they should be assigned to.

3. Try and think of games that it is difficult to attribute a genre to. What is it about these games that causes problems?

Solutions to all tasks and exercises throughout this book can be found on the associated web site.

Chapter 4

Pleasure

In the previous chapter we noted the close relationship between genre and activity profiles and how this related to the pleasures to be gained by playing particular types of games. Individuals' preferences for particular game genres are driven, to a large extent, by their preferences for certain types of activity within games. But whatever the genre or the activity profile, we are talking about the basic pleasure of taking action, of intervening, of affecting change in the environment in the particular ways offered by the game. This pleasure is characteristic of computer games. All communications media offer pleasures of one sort or another to those who make use of them. Some of these pleasures are particular to the medium and some will also be offered by other media. In this chapter we are going to build a model of the general kinds of pleasures that people experience as a result of playing games.

Watching films does not require physical activity nor does it offer any form of interaction on our part. One of the great pleasures of feature films is to lose oneself in someone else's story. Other forms of storytelling offer similar pleasures. Film also offers other pleasures of course: the pleasure of great characters and acting, of great camera work, lighting, and sets, and so on. But pleasure is at the heart of our appreciation of all communications media.

It is almost as if there are really three great generic pleasures offered by communications media:

1. The pleasure of taking part.
2. The pleasure of being told a story.
3. The pleasure of losing oneself.

You can have 1 and 3, and you can have 2 and 3, but can you have 1, 2 and 3? In this chapter we are mainly concerned with 1 and 3 but we will consider the combination of 1, 2 and 3 when we examine the classic *text adventure* game Zork.

The pleasures we gain from communications media come under the study of aesthetics and this is going to be the basis for our next invasion of the computer game world. We are of course primarily interested in the aesthetics of computer

games but as with genre we will also make reference to other media by way of comparison and illustration.

In chapter 2 of *Trigger Happy* (2004), Steven Poole pursues the notion of aesthetics in the particular context of the early game Spacewar (which first appeared in 1962), and writes, "Its structure offered many of the virtues that are still essential features of videogames:

- simple rules with innumerable combinatory possibilities;
- the competitive urge to destroy your opponent's spaceship;
- the pleasure of mastery of a well-defined, consistent system;
- the challenge of reacting instantly to craft governed by inertial physics;
- the sensual buzz of playing with animated patterns of light."

Spacewar originally ran on DEC PDP-1s, which were actually delivered with the game loaded into core memory for testing and demonstration purposes. This not only makes Spacewar one of the first computer games ever made but the first to be widely distributed. In its original form the game was displayed on a small, round cathode ray tube: white images on a black background. It consisted of two silhouettes of very simple spacecrafts with an even simpler twinkling central star. The background was enhanced with a scattering of single, white pixels representing distant stars.

If you haven't come across Spacewar before you can find links, information, and images to do with it in the List of Games at the end of this book (as you can for all games discussed in this book). There you will also find a link to the original code running on a PDP-1 emulator in Java. If you have never played Spacewar, then you should. Follow the link and play it now before you read any further: it is that important.

As Poole quite rightly points out, the aesthetic pleasures of Spacewar can be found in many of today's computer games despite its apparent simplicity. We can clearly see here the pleasure of destruction, of mastering a simple interface that demands we develop skills to use effectively. We also see the pleasure of action—as defined in the previous chapter—requiring rapid responses coupled with good hand–eye coordination. In terms of activities, we are piloting a spacecraft, using weapons, and so on. However, the game being so old, GIL doesn't have data on Spacewar.

Returning to Poole's characterization of the aesthetic pleasures of Spacewar we see that the first, "simple rules with innumerable combinatory possibilities," is more of an enabling feature of the game architecture than a pleasure in itself. It is one of the characteristics of certain types of games, such as Spacewar, that makes them so satisfying to interact with. We will return to this idea of such enabling features in a moment.

The amazing thing is that so much of what we have come to expect in a wide range of computer games was there at the very beginning. As with genres and activity profiles in the previous chapters, we would like to pursue this idea of aesthetics because knowing what people find pleasurable in a game in general will not only help us understand games better but will also help us design them better. In

particular, we would like some general principles concerning computer game aesthetics that we can then use to compare and contrast games we know well. In the next chapter we will compare our studies of aesthetics with the studies from the previous chapters to see how they all fit together. But first we need to build up our model of computer game aesthetics.

AESTHETICS AND COMPUTER GAMES

A number of people have written about the aesthetics of computer games and interactive digital media in general. In this section we are going to review some of these and use them to assemble a general aesthetics for computer games.

In the introduction to this book we mentioned some observations on the emergence of new media by Janet Murray (1997) in her excellent book, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. We are going to return to that book, as she also characterizes the enabling features that are required of the architecture of digital environments to support interactive digital media, computer games in our case. We noted a specific instance of this with respect to Spacewar above. She sees successful digital environments as having to be:

- Procedural: They make use of rules and rule-based descriptions of places, people, objects, and so on.
- Participatory: In order to appreciate the particular pleasures of digital environments, users have to take part.
- Spatial: In the sense that they are able to portray navigable space; this does not mean just 3D space, but the navigable space of the WWW, of conversations, and so on.
- Encyclopedic: Digital environments offer the potential for information spaces that are simply too big to be comprehended by the human mind.

Murray suggests these are the enabling properties that allow computer games to offer aesthetic pleasures for the player to experience and are what the creative person has to work with at an architectural level in order to create a successful game. We can see these as a high level theory of computer game architecture. When we have developed our aesthetics of computer games we can use the characterization above to find out why a game does or does not deliver on its aesthetic promises. In other words, we can identify the strength or weakness of each of the four features to support the aesthetic pleasures, or lack thereof, that a game exhibits.

We move on to the aesthetics themselves now but will stay with Janet Murray for a moment. She suggests an aesthetic for digital interactive media with three basic components:

- Immersion: Be able to become lost in the story/game.
- Agency: To feel some degree of control over what is happening.
- Transformation: To be enhanced with extra powers, to become someone else or something else.

When we play a computer game, whatever its genre, we will, if it is well designed and coded, get so lost in playing it that we will forget about the rest of the world around us; we will be so absorbed in the game that we will feel immersed; it will provide the only stimuli that we are aware of. More than this, we will derive great pleasure in this sense of losing ourselves in this artificial world.

One of the main contributing factors to this sense of immersion will be the sense of agency we feel we have, the sense of control we are able to exercise over the game world or, in most games, the battle for control. As we already said, complete control does not, on the whole, make for an enjoyable game.

And finally, in Murray's aesthetics, we may well feel transformed: we may have temporarily become someone else, another species, another creature, a machine, or a normally inanimate object, for example. This sense of transformation may be more subtle in that we are just ourselves but with extra powers or doing things we normally wouldn't dream of doing. We have no intention of ever driving a getaway car for a criminal gang but we're more than happy to do so in a game and more than happy to feel totally immersed, take pleasure in the agency we can exercise in that game-world and thoroughly enjoy this criminal transformation and breaking all the rules of the road. Sometimes transformation is more than this. In Aliens vs. Predator, many people like to play the alien and walk upside down on ceilings, spit hot acid at people, and see all this through a sort of "fish eye lens" view of the world.

So, as a starting point in our bid to establish a general aesthetics of games we have Murray's three aesthetic principles. But there are other people who have something to say on this matter. Doug Church, from the games industry, proposed a set of Formal Abstract Design Tools (FADTs) (Church, 1999) which to all intents and purposes are an aesthetic of computer games. His FADTs are:

- Intention
- Perceivable consequence
- Story

Story might seem fairly obvious, in that we all enjoy the pleasure of a good story, but intention and perceivable consequence may be less so. What he is talking about here is actually quite compatible with Murray's concept of agency. Intention is the pleasure we feel in understanding the logic of a computer game and being able to decide what action would be best to take next in order to make progress. Perceivable consequence is the pleasure we gain from seeing the results of our actions in the way the game world changes, maybe to our benefit, maybe not. Agency is not about always being right and always winning. That would make for a pretty boring game. The pleasure of agency is this interplay between our intentions, what we would like to happen, and the perceivable consequences of our actions, what actually happens. This is the real pleasure of agency, at least in computer games.

We are less happy with story as an aesthetic pleasure of games. It is easy to point out games that have no story and yet that have agency in abundance and are highly immersive. Tetris is the best example we can think of. We've played it ourselves for hours but it never occurred to us that it was a story of any sort. We could

tell stories afterwards about what we did right and what we did wrong and how we were just lucky that we got the right piece at the right time and completed four rows all at once; but there is no story in the way that there is in Shenmue, for instance. We have an important point here: not all games will offer us all the aesthetic pleasures that could be offered. Just as not all games offer a story as part of the gameplay, so not all games offer transformation as a narrative pleasure. We certainly don't become someone or something else when playing Tetris but it's still a great game (we're not going to say it again).

When we come to analyzing games in terms of aesthetics we will ask ourselves the question of "What aesthetic pleasures are on offer?" It will be another way of categorizing games.

Let's think about the pleasures of the story a little more. There are a lot of games that do not really have stories, and not just the puzzle games. *FPSs* mostly don't have what we would call a story although they might have a back-story that sets the context for the game and explains why you suddenly look like a building sized robot carrying some kind of gun the size of a family car. However, *FPSs* do have some sort of narrative component, and much more so than puzzle games. There are characters and places and events that all build up as we exercise agency. There is some kind of narrative development going on. *RPGs* by definition will have a story both in terms of the context of the game, the back-story, and in terms of how the game progresses. Narrative of some sort is important to a lot of games but not the ready-made stories that you get with films or novels.

Brenda Laurel is an artist and one of the pioneers of Virtual Reality (VR). In a famous environment of hers called "Placeholder"—in which she explores the use of VR to build collaborative stories—she came up with the idea of narrative potential. This is the idea that Virtual Environments (VEs) and therefore computer games offer the potential to build up some kind of narrative through the process of exercising agency. The narrative which builds up will not be one predetermined by the author but one based on the possibilities on offer as you make choices and progress through the game. It is your job as player to make a particular realization of these possibilities; that is how you exercise narrative potential. Many games offer the aesthetic pleasure of narrative potential and we will therefore add this to our characterization of computer game aesthetics as being more generally applicable than "story."

This is the first time we have mentioned VR but it will not be the last. VR is a very active area of research and we will make use of it when we can. VR people sometimes have different words for things than other people. When VR people talk about immersion they don't mean what gamers and Janet Murray mean. VR people use the word "presence" when they talk about the mental state of being lost in a game. When they use the word "immersion" they mean the technology which VR uses to immerse people in artificial worlds. They are talking about headsets, head-mounted displays, data-gloves, 3D mice, and so on. We bring this up because the difference between immersion and presence—as the VR people see it—is a very useful one and in this book we will stick to their usage. So from now on if we talk about immersion we are talking about technology and if we talk about presence we are talking about a state of mind.

Mihaly Csikszentmihalyi talks about agency and presence in terms of what he calls "flow," in which people talk of:

- "losing track of time"
- "losing their sense of self"
- "action follows action according to an internal logic that seems to need no conscious intervention by the actor"
- "there is little distinction between self and environment, between stimulus and response or between past, present, and future"
- "flow experiences are attained when there is a perceived match between the elements of the activity and the subject's skills." (Csikszentmihalyi, 1990)

The importance of this is that it captures the direct link between agency and presence in computer games.

Sherry Turkle is a sociologist, not a VR person, but she did talk to a huge number of people who play computer games and *MUDs* and *MOOs* in particular. As a result of this she came up with some very interesting insights into why people play computer games (Turkle, 1997). In particular, she found that playing computer games with others was one of the major aesthetic pleasures of the medium. Basically she observed that a major contributing factor for presence (state of mind of being absorbed) was co-presence (being absorbed with others). People like being with other people and, in particular, people like being online with other people. Remember, *MUDs* date back to the 1970s when text-based adventures were first networked, so co-presence goes back to the beginnings of computer games. Co-presence was an aesthetic pleasure of computer games way before 3D graphics was even thought of. At about the same time you could be co-present with Pac-Man's ghosts but that was as far as it went graphically. We'll add co-presence to our list, which is now just about complete. But when we refer to co-presence we don't just mean real people, we also mean virtual people, NPCs, alien life forms, animals, and just about anything sentient. People like being with sentient beings.

So far we've come up with a series of discussions about what various people have said about the aesthetics of computer games and other interactive media. The next step is to put it all together and make use of it.

In putting together an aesthetics of computer games we should bear in mind that it is *an* aesthetics, it is not *the* aesthetics; it's just one we put together over the last few years as we did research into computer games and tried to use these ideas in teaching. We are sure there are other aesthetic pleasures of games and we are equally sure you could add to the list yourself. It is just that we have found this particular characterization, which is summarized below, useful in trying to come to terms with the nature of games.

Our computer game aesthetics consists of:

- Agency, which is characterized by the interplay between:
  - Intention
  - Perceivable consequence

- Narrative Potential
- Transformation
- Co-presence
- Presence

We have already discussed the various elements that make up characterization of aesthetics in general so the best way to get to know them better and to see how they are useful is to use them to analyze some games. In this chapter we'll stick to some classics because the scale is more manageable.

SPACEWAR

We already discussed Steven Poole's particular aesthetics of Spacewar at the beginning of this chapter. It is time now to apply our general aesthetics and see what we get. According to Wikipedia there is only one working PDP-1 in existence. This is in the Computer History Museum in Mountain View, California. The computer and display were completely restored after two years of work and apparently Spacewar is operational on it. We can't all get to Mountain View, California, so, for that reason, we are going to analyze the version ported to PC. From the start, Spacewar was a two-player game with each player having a simple hand controller with just four controls to allow him or her to turn the craft's rocket booster on and off, rotate the craft clockwise or counterclockwise, and fire its weapon. (Check out the links at the back of this book for pictures of people playing the game in the 1960s.)

Here is Spacewar's analysis using our aesthetics:

Agency: Four keyboard controls allow you to pivot your spacecraft in either direction, power up your rocket engine, and fire your weapon, respectively. However, because you are in space and dealing with inertial physics, maneuvering is not easy; in fact, it's a real challenge. And there's this little sun in the middle of the screen whose gravity sucks you in and around and throws you back out again; and, if you're not careful, you get sucked right in and die. Firing your weapons is fun because it's a two-player game and your opponent is grappling with that inertial physics stuff as well. You have good intentions and so does your opponent but getting your spaceship to do what you want it to and destroying your enemy is not easy and the perceivable consequences are often not what you intended. It is very graceful and fascinating to watch.

- **Narrative Potential**: It is not a story as such but there are dramatic situations that build up. Spacecraft collide or get flung about by the sun's gravity and lasers glide gracefully across the vacuum of space. There is definitely narrative potential and exercising agency is almost bound to realize it.
- **Transformation**: We're piloting a spaceship and firing laser weapons in deepest space; transformation enough for 1962 and for now, for that matter.

- **Co-presence**: We even have co-presence. This incredibly early game is two-player; we are present with our opponent manifest in the skillful (or not) co-presence of the other human at the other set of controls. No AI of the day could approach a human opponent.
- **Presence:** It is very well documented that Spacewar was highly addictive and people played it for hours. Players were literally "lost in space."

Not bad for a game that is almost forty years old. Why was it so successful? Well, if we reconsider Spacewar in terms of Janet Murray's enabling features of computer games:

- **Procedural**: The game is nicely procedural. There are not a lot of objects to define; just four, in fact: the two spaceships, the little sun, and the missiles you fire; but these are very effective.
- **Participatory**: There is definitely "flow" material here; take a look at Csik-szentmihalyi's characterization again.
- **Spatial**: The game is not too spatial in terms of "space," which is just a black square, basically but in terms of the gameplay space it's huge. The combinatorial possibilities of your own spacecraft controls are enormous and combined with your opponents you definitely get a huge number of gameplay situations.
- **Encyclopedic**: This characteristic is not particularly relevent here but it doesn't have to be with this type of game.

Spacewar is a highly playable game to this day and still looks surprisingly modern. One of the reasons for this is that the game so cleverly evokes deep space despite its very limited resources to do so. We'll seek to explain how it does this in terms of theory in Part II of this book.

ZORK

Sixteen years or so later we get another type of game represented here by Zork, an early *text adventure* game. There is no action or twitch, not even in the fight scenes; there are people to talk to, and time to think. It appeared in 1977 and has an imaginary landscape of forests, buildings, enemies, objects to collect and use, and so on. The following is a short opening sequence—only one of many of course—from Zork: The Great Underground Empire, which appeared in the early 1980s:

```
ZORK I: The Great Underground Empire
Copyright (c) 1981, 1982, 1983 Infocom, Inc. All rights
reserved.
ZORK is a registered trademark of Infocom, Inc.
Revision 88 / Serial number 840726

West of House
You are standing in an open field west of a white house, with a
boarded front door.
```

There is a small mailbox here.

>open mailbox
Opening the small mailbox reveals a leaflet.

>read leaflet
(Taken)
"WELCOME TO ZORK!

ZORK is a game of adventure, danger, and low cunning. In it you
will explore some of the most amazing territory ever seen by
mortals. No computer should be without one!"

>go east
The door is boarded and you can't remove the boards.

>go north
North of House
You are facing the north side of a white house. There is no
door here, and all the windows are boarded up. To the north a
narrow path winds through the trees.

>go south
The windows are all boarded.

>go east
Behind House
You are behind the white house. A path leads into the forest to
the east. In one corner of the house there is a small window
which is slightly ajar.

>open window
With great effort, you open the window far enough to allow
entry.

>go inside
Kitchen
You are in the kitchen of the white house. A table seems to
have been used recently for the preparation of food. A passage
leads to the west and a dark staircase can be seen leading
upward. A dark chimney leads down and to the east is a small
window which is open.
On the table is an elongated brown sack, smelling of hot
peppers.
A bottle is sitting on the table.
The glass bottle contains:
A quantity of water

>go west
Living Room
You are in the living room. There is a doorway to the east, a
wooden door with strange gothic lettering to the west, which
appears to be nailed shut, a trophy case, and a large oriental
rug in the center of the room.
Above the trophy case hangs an elvish sword of great antiquity.
A battery-powered brass lantern is on the trophy case.

```
>pick up lantern
Taken.

>pick up sword
Taken.

>move rug
With a great effort, the rug is moved to one side of the room,
revealing the dusty cover of a closed trap door.

>open trap door
The door reluctantly opens to reveal a rickety staircase
descending into darkness.

> go down
You have moved into a dark place.
The trap door crashes shut, and you hear someone barring it.
It is pitch black. You are likely to be eaten by a grue.

>fight grue
What do you want to fight the grue with?

>sword
It's too dark to see!

>go south
Oh, no! A lurking grue slithered into the room and devoured you!

**** You have died ****

Now, let's take a look here ... Well, you probably deserve
another chance. I can't quite fix you up completely, but you
can't have everything.
```

You know what is coming so we won't bother with the lists; a strong sense of agency. You have to choose which direction you want to go in and are rewarded with information about the consequences of your choice. You also have choices as to what actions to take and objects to pick up and use. The consequences are not always what you would want. For instance, trying to fight the grue with the sword results in your being told it is too dark unless you lit the brass lantern before entering the basement. There are some 150 different command combinations that Zork recognizes. If you try something out that is not recognized you get a simple message to tell you so. You do not always get what you want and that is one of the real pleasures of this game. You have time to sort out your intentions and to consider their perceivable consequences. You have to plan ahead.

In terms of narrative potential, you can certainly build up your own stories of how you eventually completed the quest. There is no single route through the quest—in fact there are thousands of them—so most people's stories will be different, perhaps dramatically so. It's also highly unlikely that you will complete the game at one sitting but instead will have to make many saves and restarts, thus adding to narrative potential. There is so much narrative potential, in fact, that to this day you can still download crib sheets from the web to help you out if you get

stuck. In fact, *text adventures* have given rise to "interactive fiction" which is alive and well as we write these words (Montfort, 2005). There is a real story here: It is possible to have generic pleasures 1, 2, and 3.

You are not who you really are, nor are you where you would normally be. You are on a classic quest and you are the hero willing to risk your life—many times— in order to save the princess. You are transformed. Additionally, there are people, grues and other creatures and monsters. Co-presence is a primary aesthetic pleasure of Zork.

It is well documented how absorbed people have become interacting with Zork and the illusion generated in players' minds is far better maintained because of the consistency of the text and players' own creative imaginings of the landscape, castles, and so on. Of course, none of these were "before their very eyes" but rather behind their very eyes, in their minds. Zork is a classic and you should think back to the observations we made in Chapter 2, on genre theory. The *text adventure* game may have disappeared but the *adventure* genre continues to this day in a variety of modes, yet it is still basically the same genre as it was all those years ago. You can see its influence on console *action adventure* games such as The Legend of Zelda and in latter day 3D games such as Thief and the whole range of *stealth* games in general.

Why was it so successful? Zork is highly procedural, with the landscape, buildings, doorways, objects, and so on all defined procedurally. In addition, there is a procedural definition of syntax and grammar so that Zork can recognize and respond appropriately to commands. Zork does not do any great analysis of your input phrases. It simply looks for appropriate words to respond to. Although participation is restricted to keyboard commands there is a lot for the user to do and keyboard commands can be analogues for dramatic actions such as sword fights.

Zork is spatial in that there is a conceptual landscape players can explore by entering commands to go north, south, east, and so on. It is also spatial in the sense that there are rooms behind closed doors. Zork is not spatial as Doom is in a visual sense; it is more akin to a complex website with many interwoven links and levels. You have to imagine the spaces because you cannot see them.

Zork is a large environment that takes time and effort to map out in your mind. We doubt if most people have anything like a complete map of Zork even after many hours of playing it. The fact that you can only "see" exactly what is directly in front of you helps in this respect. In fact, most players would use pencil and paper to record where they had been, what their current inventory was, and so on.

Despite the fact that Zork is purely text-based, it was in its day a highly rewarding aesthetic experience. Even today people still play *MUDs* and *MOOs*, which are the text adventure's networked descendants. In those days universities had mainframe computers with tens or hundreds of "dumb terminals" connected up to them. These dumb terminals only had basic command prompts and when you hit "enter," a request was sent off to the main processor on the mainframe which did the calculation and sent back the result to be displayed on the command prompt of your console. That was the kind of network that early *MUDs* were played on. *MMORPGs*, well *MMOAdventures*, go right back to the early days of computer games.

For more information on Zork, *text adventures*, and interactive fiction in general you should read Simon Montfort's *Twisty Little Passages* (2005).

PAC-MAN

What's coming now will follow a familiar pattern. Pac-Man is usually credited as being the first video game character. Before that, you steered spaceships, gun turrets, moon landers, and other, almost always mechanical, devices. Here is a quote from Toru Iwatani, the creator of Pac-Man: "I designed Pac-Man to be the simplest character possible, without any features such as eyes or limbs. Rather than defining the image of Pac-Man for the player, I wanted to leave that to each player's imagination." As usual, links for images and reviews of Pac-Man can be found at the end of this book.

In its day Pac-Man was a great success and as popular with girls as with boys. Let's take a look at Pac-Man in terms of our aesthetics and see if we can get a clue to its enduring popularity.

Pac-Man is interesting in terms of agency because at first sight, thinking purely in terms of interaction and interface, the player doesn't actually have much to do. You simply select a direction for Pac-Man to travel in. However, in terms of intention and perceivable consequence we see that Pac-Man is actually quite sophisticated. Your character needs to chomp through as many "pills" as possible to gain points. We can also direct him to the big pills, which are power-ups as well as more points, and allow Pac-Man to kill the ghosts. Of course we have to make sure he avoids the ghosts when they cannot be killed because they cause Pac-Man to lose a life. The player can also choose to get Pac-Man to eat the fruit that appears from time to time in order to gain yet more points. The actions the player performs are very basic and easily learned but Pac-Man is about strategy: avoiding getting killed by the ghosts, killing ghosts, gaining as many points as possible, and getting onto the next level. Pac-Man constantly prompts us to consider intention—what we would like to make happen—and perceivable consequence—what actually happens. It is faster paced than Zork but not as twitchy as Spacewar. This is at the heart of the success and pleasure of Pac-Man.

At first sight we have a story about the supernatural, ghosts, and haunted houses, along with a strange chomping mouth that eats anything it comes into contact with. Each game of Pac-Man is different but after a while the actual characters become of lesser interest as they fail to develop and the levels are always laid out in the same way. We can tell stories about how we succeeded or failed, but there is no real story to build up—we just get to recount what we did, much in the same way as you could with Tetris.

Are we transformed into Pac-Man? It seems unlikely. We might empathize with him to the extent that we don't want him to die but we do not think we become Pac-Man in the sense that we do with shooters and certainly not RPGs. But we should try putting ourselves back into the mindset of people who played Pac-Man

in the early 1990s when he was state of the art. People may well have empathized much more with him as a character then.

In playing Pac-Man you were certainly in the presence of sentient beings in the form of the ghosts whose behavior you have to be constantly aware of. And it is well documented that people became highly involved with Pac-Man to the extent that they very often forgot where they actually were. So we have a game that is high on agency and presence, strong on co-presence, but weaker on narrative potential and transformation. As we have already observed, there is nothing unusual or problematic about this. Many games follow this pattern.

Pac-Man is procedural in that there are representations of characters' and objects' behavior and appearance. It is the simplicity and yet combinatorial complexity of the possibilities offered by these procedural descriptions that makes Pac-Man so appealing. There is no question about this even though the physical actions we perform at the interface are very few and very simple.

Pac-Man is spatial in the sense that we have a 2D space to traverse but the levels are always the same. We do not discover new layouts as we progress from level to level. It has a certain spatiality in terms of the gameplay space as did Spacewar.

Pac-Man is hardly encyclopedic. After a few minutes and a few levels the player realizes that he or she has seen all that there is to see and it becomes a more abstract game of skill.

COMPARATIVE AESTHETICS

This discussion of aesthetics does not tell the whole story. Different genres and activity profiles require significant differences in terms of agency. The pleasure to be had from slaughtering psychotic alien beasts in *shoot-'em-ups* is presumably quite different from solving the puzzles in Myst or Riven. However, they both arise from agency. Some games are all about agency and presence. In some narrative potential assumes a major role. Games are pleasurable in different ways. Our aesthetics provides a model for discussion, comparing and contrasting games in a manner complementary to the discussions of genre and activity profiles in the previous chapters. In the next chapter we undertake a short case study to make this clear. Before that, let's just review this chapter.

What this discussion of aesthetics has given us is a means of generalizing our assessments of games beyond the well-meaning guidelines and advice of the commercial games media. It allows us to compare and contrast three apparently divergent games: Spacewar, Zork, and Pac-Man. Spacewar is obviously a *shooter*. In fact, it is the first *shooter*. Zork is rightly referred to as a *text-adventure*. Pac-Man is usually referred to as variously *retro* or *classic* which is fine for a historical classification of games but is useless for the kind of investigation we are undertaking. However, might we not see Pac-Man as an evolutionary step on the way to the classic *platform* game?

Looking at our analyses for the three games above makes it obvious that agency works in different ways for different applications domains:

- At an online shopping site we want to be in complete control; we want information about products and payments, we want to be completely aware of the payment process, where we are in it, and how safe our credit card details are.

- In Zork and the majority of other games there is a fine balance between how much we are in control and how much we are at the mercy of the game's engine and any intelligent agents currently active. An appropriate sense of agency—and an appropriate but also surprising mismatch between intention and perceivable consequence—is of central importance to the success of any game.

What does "control" mean? Navigational control? Control over the forces at work within the game? In a *text-adventure* you will have the former but battle for the latter. In a racing game you will have a bit of both. The better you get at navigating—literally driving, in this case—the more control you have and this increasing sense of skill and control is one of the pleasures of such games. As we already pointed out, in an online shopping site you want to be in complete control of both. Imagine a little thief sprite that ran up and stole your money and books on some random basis once you had entered your credit details. If this happened at Amazon.com you would be rightly annoyed and stop using the site. If it happened in a game such as Thief you might find it an intriguing aspect of the gameplay and seek ways to protect yourself and get your belongings back.

We believe narrative potential to be fundamental to games, but again, the types of narrative potential appropriate to different genres might well determine the nature or even possibility of stories that will arise for users through the exercise of agency. The kind of stories you carry away from Spacewar or Zork will be very different. In the former it will be a recounting of your successes and failures, in the latter it will be a story, your story within all the possible stories that Zork offers.

As with narrative potential, transformation plays very different roles for different genres and might seem effectively irrelevant to some—many puzzle games, for instance. However, losing yourself, as many people do in puzzle games, is also a very pleasurable form of transformation for those who want, for example, to enter a very simple gameplay world that makes them forget the complexities and stresses and strains of their everyday lives. The vast majority of games offer transformation in some form or other.

It is interesting how early co-presence found its way into computer games. All the games we have analyzed aesthetically in this chapter offer co-presence as a contributing pleasure. Yet they do it in quite different ways and for different reasons. In Spacewar, co-presence provides the active threat, the major disruption of your intentions and thus the major source of pleasure for this type of game. In Pac-Man co-presence, in the form of the ghosts, is only a possible confrontational pleasure; you could actually get very far into Pac-Man's ever more frantic levels having always just avoided the ghosts and collected points in other ways. In Zork, there is the element of confrontation and at times confrontation is the only option, but Zork

is also a social space where people live and can be talked to and can give you information. In Zork you are co-present in a whole variety of ways.

In many ways, aesthetics are fundamental to good game design. Aesthetics talks about general characteristics of communications media and the particular but general pleasures which are the end result of interacting with a particular game.

The underlying architectural features of games, procedural, participatory, spatial, and encyclopedic, help us to understand why particular games perhaps do not work aesthetically as well as they might: the game is not encyclopedic enough; it is not spatial enough, it is procedural but there are not enough rules and/or the rules are naive or just plain wrong. They are actually general properties of game content, the actual stimuli that the game engine delivers through its interface technologies. If a game does work then these features can help us. They can be very useful in "fault diagnoses." We could do more if we had a more detailed theory of game content to work with. That is the subject of Part II of this book, "What Is a Game?"

SUMMARY

We can observe a common characteristic of all three of the games analyzed in this chapter. In terms of content, they are all abstractions of the worlds they seek to simulate. Even later, apparently more realistic games rely on such abstractions. One of the prime arts of game design is to get the abstractions right. Aesthetics tells us where to look for those abstractions, where we cannot afford to make cuts. Content should be developed to enable agency first of all. For it is from agency that all other aesthetic pleasures of games flow.

The aesthetics we are working with do not tell us exactly what meanings people derive from games but, importantly, they do point to the pleasures people derive from playing them. At the beginning of this chapter we made the distinction between the pleasure of taking part, the pleasure of being told a story, and the pleasure of losing oneself.

The contrast between film and interactive media such as games makes this quite clear:

- Film has a strong potential for narrative, rather than narrative potential, and presence and co-presence; a lesser potential for transformation; and no potential for agency.
- Games have strong potential for agency; narrative potential, rather than narrative; co-presence is often very strong; and presence and a strong potential for transformation are important.

We are dealing here with both ends of the media spectrum: being told a story and being part of a story. Both are pleasurable experiences if well done, but the doing and taking part of that is at the heart of games and the way this affects meaning is very much the subject of Part II of this book. Before that, the next chapter looks at two more modern games in some detail and makes use of all the theories studied

thus far, genre, activity profiling, and aesthetics, in order to show how they complement each other.

TASKS

In this chapter we used an aesthetic of games to analyze three classic games and then used Janet Murray's enabling features of games to see how their strengths and limitations arose.

You might like to have a go yourself now:

1. Choose a different classic game and do the aesthetic analysis yourself. Use Murray's enabling features to explain any strengths and/or limitations you have identified. Your objective for this task should simply be to get used to applying these ideas for yourself.

2. Choose a more recent game that you are familiar with and have enjoyed playing and again do an aesthetic analysis of it. Your objective for this task is to try to come up with some justification based on your analysis for your enjoying the game. You might like to use GIL to view the activity profile of your game and see how this helps.

3. On the whole, older, classic games don't have profiles in GIL. Try drawing up your own for the games we have discussed in this chapter. Select which activity groups apply to Spacewar, for instance, and decide how important they are. Use the "Activity Sliders" in GIL to set up your profile and "Find Nearest Games" to see which modern titles have similar activities to those you have entered.

Many of the sources for further reading have been referenced already as this chapter has progressed but we will quickly review them and point out their potential contributions. For an excellent introduction to the aesthetics of interactive media in general, and interactive storytelling in particular, Janet Murray's book, *Hamlet on the Holodeck* (1997), is an excellent and very readable starting point. Doug Church's short but insightful article on FADTs is well worth studying (Church, 1999). "Placeholder" is an excellent starting point for considering narrative potential in more detail (Laurel). For those interested in pursuing co-presence, Sherry Turkle's book should be required reading (Turkle, 1997). To find out more about the history of the *text adventure* and how it evolved into interactive fiction, you should consult Nick Montfort's book *Twisty Little Passages* (2005).

Chapter 5

Two *Rail-Shooters*

So far so good. We have developed theories for genre, activity profiling, and aesthetics and we have used them to analyze a group of fairly recent games in the context of genre and activity profiling and some retro classics in the context of aesthetics. One reason for the latter is that our analysis of genre, and particularly the central role of agency in computer games, seems to suggest that the underlying nature of games is not developing as fast as their mode of presentation. In other words, the graphics has become a lot more sophisticated but in many ways the gameplay has not developed nearly as much. Our observations on the development of the *adventure* genre would seem to bear this out. It is also the case that many early games were developed on a far less grand scale and are thus easier to analyze than many contemporary ones.

On the other hand, we have no intention of suggesting that there are no new developments in contemporary games nor that we have no need to study or analyze them. Let's make a start now by looking at a genre over time and studying two *rail-shooters* in depth, using all our theories to date. In doing so we will also show how genre, activity profiling, and aesthetics complement each other in our analyses.

STAR FOX AND REZ

Rail-shooters go back quite a long way. Their origins can be traced back to so-called *tube shooters*, which were an early attempt to introduce three dimensions into games by constraining the player to a fixed path. This allowed demands on real-time 3D graphics processing to be managed. Atari's Tempest from 1981 is a very early example of such a game. The next step was to allow the player to follow a specific path as if he or she were on invisible rails rather than inside tubes or corridors. This means it looks as if you can be flying quite freely through an open scenescape of whatever sort. Clive first came across rail shooters through the excellent Star Fox[1] released for the SNES by Nintendo in 1993.

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[1] Released in Europe as Star Wing for legal reasons now resolved.

The game requires you to pilot a star fighter through various, very simple, 3D obstacles and shoot up enemy installations along the way. Sometimes you are actually in a tube at breakneck speed confronted by sliding doors that partially block your way or close right up in front of you. Sometimes you are outside over a landscape of buildings and giant ground machines and flying enemies of various shapes and sizes. It was a level based game, much like the standard *platforms* of the day, and, like the majority of them, the obstacles and baddies would be in the same places each time you reran a level.

In terms of interaction, you had more freedom than a *platform* but not as much as in even an early *shooter* like Doom or Castle Wolfenstein. As you flew down the preprogrammed path, the rail, you could only vary the position of your fighter within the view at any one time but had no control over direction or speed. There were two reasons to vary your up/down, left/right position at any time:

- to avoid obstacles and therefore avoid crashing and failing the level, and
- to aim and fire your weapon to destroy buildings, ground machines, flying machines, and so on along the flight path; some of which might attack you.

In its day the *rail-shooter* was a way of escaping the platform mode that was so prevalent at the time but without accepting the full demands of a true 3D game environment. Star Fox escaped the technological limitations of the day by having a 3D graphics accelerator chip built into the game cartridge itself. Stunt Race FX was another Nintendo game that used the same technology. Star Fox has turned into a successful franchise for Nintendo and there have now been five versions of the game released on four different platforms. Three of these games follow the classic *rail-shooter* format but of course the graphics have improved immeasurably.

Released in 2002, Rez was one of the hit games of that year and won its developers a host of prizes. We can see that Rez has many of the characteristics of a typical *rail-shooter*: you fly down a set path, you can move up/down, left/right within the current view, you have to shoot stuff, you can get power-ups, you can get killed, there is a big boss to kill at the end of each level, and so on. Again, it also has many of the characteristics of *platform* because each level appears much the same each time you play it. Audio-visually Rez is stunning, a treat for the senses. Pumping trance beats are generated by the player's selecting and destroying objects flying toward the screen. Simple wire frames visualize most of the objects encountered, overlaid with beautiful multicolored explosions.

Yet Rez is something of an enigma; it means different things to different people: to some it's a *shooter*, to some it's a *music game*, to some it's an old form revived, to some it's new and revolutionary; many love it and many hate it. That makes it an interesting game to study. We will learn more when we look at its activity profile.

Later on we will look at what the game's lead developer, Tetsuya Mizuguchi, has to say about it and see how that fits in with our understanding of the game itself. We'll also attempt to understand both Rez and Star Fox in a more objective way using relevant theory and suggest further answers to our question, "Why do people play games?"

Rez and Star Fox are both *rail-shooters* so they are going to be pretty similar, right? Let's find out.

ACTIVITY PROFILING AND GENRE THEORY

First of all let's consider the activity profile for Star Fox Assault. As you can see from Figure 5.1, by far the most important activity is mission-based, followed closely by confronting and use of weapons. Classic activities for *shooters* with a back-story, which Star Fox definitely has as we will see, by looking at the medium scoring activities, in descending order: flying, targeting, attacking; again, all typical of *shooters* in general and *rail-shooters* in particular. Following on from this we have a large group of low scoring activities, for instance: defending, exploring, maneuvering, powering up, rescuing, stunts, and warfare. Rescuing is interesting because you have the other pilots on your wing whom you can help out. All in all there are 16 activities scoring 2 or more. This is quite a complex profile for a *shooter* and it gets a relatively high twitch factor of 1.3 which is what you'd expect of a game in this genre.

Star Fox is a *shooter* in which you have powerful enemy forces to battle it out with all the time in a series of missions. There is a good deal of actual flying; you have to position your star fighter in order to be able to make use of weapons accurately. This all comes out in the high scoring activities. The large number of low scoring activities, such things as accumulating rewards, stunts, trading, and so on, point to a deceptively complex game playing experience.
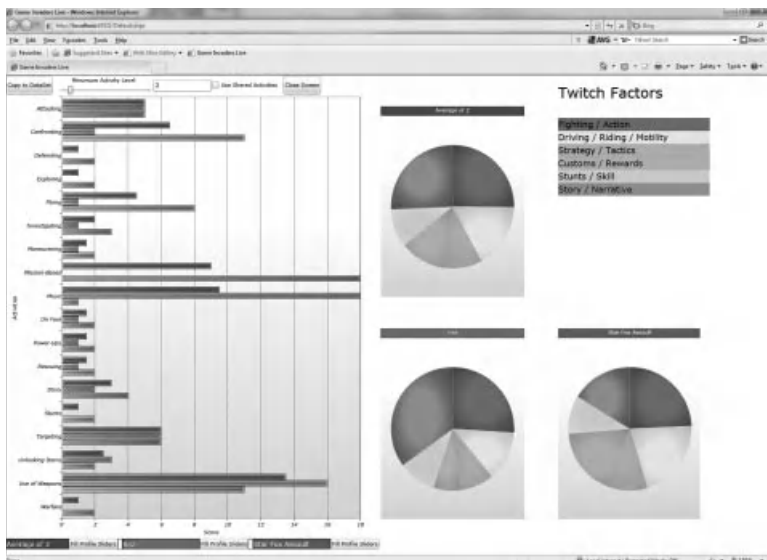

Figure 5.1   Activity profiles for Star Fox Assault and Rez. (See color insert.)

Moving on to Rez, let's start with the way the media categorize the game in terms of genre. Many reviewers categorize it as a *shooter*, pure and simple. Some of the more conscientious reviewers categorize it as a *rail-shooter* for the reason that, although we have a 3D viewpoint, the path we take through that 3D world is preset. The player can adjust his or her position in that viewpoint or, as is the case with Rez, adjust his or her gun sight within the view offered at any one time, but our paths through the various levels are out of our control.

Now let's consider Rez's activity profile, which should be very different. The top scoring activity is music, a very non-twitchy activity and the only one to get the maximum score. This is closely followed by use of weapons, which is what you mostly do in Rez. Following this we have three lower scoring activities: targeting (6), attacking (5) and unlocking items (3). Finally there are just two activities scoring 2: confronting and story. All in all, only seven activities score 2 or more. This is a very focused game, where you listen to music and watch the visuals as a result of targeting and using your weapons.

So although the highest scoring activity is one of the three least twitchy ones possible, you might call it a fairly twitchy music making game. It actually gets a twitch factor of 0.8, which is very non-twitchy for a *shooter*. Rez is not a typical *shooter* but follows on in its own way from games such as Parappa the Rapper and Gitaroo Man. Rez helped to set the continuing trend that is the *rhythm action* genre.

The way you make the music more interesting and intricate is by locking onto as many incoming missiles as possible and destroying them all in one go. This enables you to build your own trance music track over the underlying beat. Alongside music we could add the activity of simply losing ourselves in the beauty of the visual display of explosions and wire frame backgrounds, but GIL doesn't actually measure this yet.

Notice that Star Wing had confronting as one of its two top activities whereas Rez has it as one of its seven low scoring activities. Apart from the level bosses, there is not very much in the way of actually fighting, as in one-on-one combat, in Rez so this explains the big difference in this respect.

Unlike Star Wing, story scores very low in Rez. There is a back-story but we don't think anyone takes much notice of it. However, it is discussed toward the end of this chapter in the context of the making of Rez and the complex aesthetics the author used as a driving force in the game's development. To us, Rez works as a sort of interactive, animated abstract painting and music machine. You don't think too much about rationalizing it; it is best just to experience it. Conversely, Star Wing clearly works within the genre of the *shooter*, but because of the on-rails activity it is possible to concentrate on shooting and targeting specifically rather than piloting your star ship as such; although you do spend quite a lot of time positioning it within the view you have.

Once again this emphasizes the usefulness of activity profiling and twitch factors in bringing out the subtle differences between games which apparently belong to the same traditional genre. Rez and Star Fox are similar but different. They have very different twitch factors and their activity profiles show them to be quite

different in the many respects which we have highlighted. Having established activity profiles for our two games, we can now go on to consider aesthetics.

APPLYING AESTHETIC THEORY

In Star Fox we have a classic *rail-shooter* and the agency involves some piloting our star fighter, from a third person perspective, navigating around all sorts of large obstacles, firing a gun to destroy stuff, avoiding things firing at you, collecting power-ups, and so on. So your intentions are more varied than Rez. You want to rack up points, avoid danger, get in good positions to destroy targets, and so on. The perceivable consequences are all directly associated with your intentions. Did you get in the right position? Did you destroy? Did you avoid? It is often useful to refer to the twitch factor when we are talking about agency. From Figure 5.1 we can see that the twitchy activities predominate and the twitch factor score of 1.3 confirms that this is a fairly twitchy game.

Narrative potential is very much that of a traditional, level-based game. You build up to the level boss for the major shoot-out which leads to completing the level. If you die you get to repeat the level and get to know its narrative development. Explosions are explosions and the music drives on in the background unsynchronized with the gameplay. Star Fox plays by the rules—the genre rules, that is.

We are a fox piloting a starship! That seems like transformation to me. The sense of transformation is probably enhanced by the fact that it is a lot easier to die in Star Fox than in Rez. We can be shot at and crash into buildings and other solid objects.

We are also co-present as we fly as a member of a four-person/animal wing where our other pilots are an eagle, a rabbit, and a frog. Your other wing members can help you to some extent and you can help them to a limited extent. They get very upset if you attack them! The additional aesthetic of co-presence contributes mightily to a strong sense of presence. Due to its advanced 3D graphics—in its day of course—the aesthetic pleasures of Star Fox were intensified along with the presence that ensued.

Now let's move on to Rez, which can be very twitchy or rather more laid back depending on how you want to play it. This is because you can either shoot objects directly—just aim the gun sight and press fire—or you can lock onto them and destroy a whole bunch at a time. You can also instigate the power-up sequence by shooting the appropriate object as it moves in your view. So intention is concerned with destroying any moving object. You are rarely under direct threat but there are missiles that will kill you if you let them hit you. Perceivable consequences consist, not surprisingly, of explosions which tell you what you have destroyed. You soon learn what to expect if you press fire with a bunch of objects locked on. If you got the power-up object you will then get a sequence of these, leading to the power-up itself.

But perceivable consequences are more than this as the explosions are stunningly beautiful and are made up of bright flashes of light and colorful clouds of

dust and smoke. The sounds that accompany the explosions are actually the sort of musical sounds that make up trance dance tracks. So the effect of destroying things is to create music on the side. In support of this, the music in the background while you play is made up of trance beats supported by a "clap" every time you select something to destroy. You complete the soundtrack as you play. In Rez the twitchy activities score a little lower than the non-twitchy ones as can be seen from the pie chart, and the twitch factor score of 0.8 confirms what we have been saying.

This is a level-based game that develops with sequences of confrontations followed by power-ups, leading to a face-off with the end-of-level boss. The character also moves through a series of higher levels of existence (gets more powerful) the more successful you are; and the reverse if you are unsuccessful. You can die and have to repeat levels but it becomes quite unusual as your skill levels increase. So the narrative potential does not play a major part in the aesthetic pleasure of playing the game. There are however the musical and graphical developments which, although synchronized with the expected narrative build-up of a *rail-shooter*, also seem to have an aesthetic life of their own, having as much to do with art and music. The latter depends on who you are of course. Some players will be far more intent on the specific aesthetic of agency and completing the level than these other aesthetic references that we find so appealing.

In terms of transformation, we personally do not see this as being of particular importance. We don't associate ourselves with this character to any degree although the transformation into higher modes of existence—more colors and powers—is very satisfying. This is a *platform* character rather than an RPG one. By that we mean that it serves as the focus of the agency offered to us but there are no character traits to get to know, no character development as such, nothing to empathize with. Co-presence to our minds is even less important in this game than transformation.

In terms of presence the game is highly engaging; at least it was for us. And it was the additional aesthetic pleasures referencing art and music that did it for us. These are discussed below. Without them we do not think we would have found such a game as presence inducing; not nowadays anyway. In the days when Star Fox first came out that was very different.

In comparing Rez and Star Fox we see that the latter is a typical game of its genre and highly developed for its day. Agency is actually more varied in Star Fox, there is more to do and more skill required to accomplish it. This is supported by a definite sense of transformation and active co-presence, neither of which are offered by Rez. Star Fox is ten years older than Rez, runs on decidedly inferior technology, and yet seems a fuller game in some respects, at least in terms of our analysis so far. Yet Rez is a great game and seems revolutionary in its own right. It certainly is not inferior to Star Fox; it is similar but very different. Very interestingly, Rez relies on agency and presence. The other aesthetic pleasures are not present. This is no accident. The visual and auditory beauty of Rez is not weakened by the unnecessary complications of narrative potential, transformation, and co-presence. Indeed this could be seen as a marker for the rise of the casual game as a commercial reality that began in 2008–9 and continues to this day. We go into this in more detail in the next chapter.

THE METHOD OF GAME ANALYSIS

Just a few thoughts on the way we have been using our theories in this chapter. Genre analysis and activity profiling go well together. In this chapter we started out with some discussion of the genre(s) attributed to the two games by professional review sites. We then went on to consider the activity profiles for the two games. The two views are useful. Genre tells us where a game sits within popular game culture, while the activity profile is a more objective measure of the way professional reviewers are thinking about a game. Putting the two together we can arrive at a quite detailed view, an introduction, to the game.

Twitch factors seem to sit far more readily with aesthetics and, in particular, can help to confirm, whether or not our analysis of agency, in particular, is justified. In this sense they do help to add focus to our investigations into the nature of intentions and perceivable consequences for the game under scrutiny.

So we have the beginnings of a method of analysis here:

1. Start with the high-level views of genre and activity profiling to get an overall view of the game;
2. Then use twitch factors as a starting point to begin unraveling agency, before going on to consider intention and perceivable consequence in more detail;
3. Finally, go on to consider narrative potential, transformation, co-presence, and presence

In Part II we will add in some more theory and expand on this basic method.

TETSUYA MIZUGUCHI, REZ, AND BEYOND

So Rez is a simple game in terms of our aesthetic principles. Let's pursue this further. On the back cover of its box Rez is described thus, "Rez is an endorphin machine, releasing the essence of trance through futuristic sound, visuals, and vibrations. Journey through cyberspace as visualized by the 'system,' in your quest to awaken 'eden,' . . . can you beat the system? Ladies and Gentlemen, open your senses, go to synesthesia."

There are three things going on in this bit of publicity blurb: the back-story that sets the context for the game, a claim that "Rez is an endorphin machine," and the command to "open your senses, go to synesthesia." What on earth, or elsewhere, is going on here and what on earth is an "endorphin machine," let alone synesthesia?

It seems to us that the back-story about cyberspace and the "system" are just a way of distancing the game from any notion of simulating anything that might be conceived of as "real life." We are inside cyberspace "as visualized by the 'system,'" which basically means that anything goes: so far so good. The film Tron used just such an approach to simulate a human character getting literally sucked into a computer game.

Now on to the other stuff; endorphins are pain killing chemicals, analgesics and anesthetics that are produced naturally in the brain to reduce pain. They are also produced as a result of exercise, sexual activity, bungee jumping and other extreme sports and, interestingly, laughter. So-called thrill seekers and adrenaline junkies may not be addicted to the rush of adrenaline but to an endorphin high. We might view endorphins as the brain's chemistry of pleasure, in other words, the mechanism by which we feel the aesthetic pleasures of games. This means that Rez is an "endorphin machine" because its gameplay stimulates aesthetic pleasures to a high degree. Actually, all good games should do this, but Rez is designed to do this in particular ways and this is where that word synesthesia comes in.

In the previous section we noted the importance of music and graphics to the aesthetic pleasures of Rez. These turned an old game form into something that seemed new and even revolutionary, but there is much more to it than just interesting sound and graphics, and, indeed, vibrations in the Japanese version of the game. In the development of Rez, sound and graphics are synchronized as part of an integrated or synthesized aesthetic experience, synesthesia. This is a phenomenon that has been discussed by artists since a hundred years ago, people like the painter Kandinsky and the composer Scriabin, who were looking at the way different senses work together or cross over.

For example, when you hear something, those sounds might create a picture in your mind. You might smell something, and link that to a visual image. Now we can create art that combines different senses, seeing, hearing, feeling, and so on, together. Rez attempts to put this into practice because the messages it sends to different senses are not discrete components of the experience. They all interact with and influence each other.

Mizuguchi explains it best himself. "Basically, in our use, whenever you hear a sound it evokes a visual representation and whenever you see a visual image there is always the sense of its representation in sound. Or when you smell something it reminds you of a sound you've heard. Any time there is one sense interconnected with another, that's synesthesia: the interconnection of all the senses. So to use synaesthesia is to provide an experience on many different sensual levels" (quote from an interview no longer available).

For a number of years Clive regularly took the Circle Line train in London between Victoria Station and Earls Court. He would arrive at Victoria main line station, go down the escalator and walk through the underground subway passages and then finally up a flight of steps to finally arrive at the far end of the Circle Line station. At that end of the platform and only at that end there was a smell; something to do with oil and electricity and grime and something else. But that smell always reminded Clive of his grandmother's breakfasts and bubble and squeak in particular. It always brought to his mind a picture of the family sitting down to breakfast and all the furniture, the pictures on the walls, the open fire, and so many other details he was always surprised that he remembered. All because of a strange smell on the London Underground. That's synesthesia.

What Mizuguchi doesn't say in the above quote but which does become apparent in another interview (Mizuguchi) is that the visual and auditory synesthesia

works directly with the gameplay aesthetics. In other words, the synthesis is intended to coordinate all aesthetic pleasures of the game resulting in the synthesised pleasures of agency, of realizing narrative potential, of stunning imagery, and of entrancing music. This is why Rez manages to be both the reiteration of a well known game genre from the past and a revolutionary new game experience. Mizuguchi is deliberately trying to raise computer gaming from mass entertainment to an art form to rival painting and music.

These references to fine art work in a number of other ways. The visual imagery of Rez is directly evocative of the work of the twentieth-century painter Wassily Kandinsky. Compare the paintings of Kandinsky with screen shots of Rez and you will see what I mean. This is a deliberate decision on the part of Mizuguchi and it is almost as if we are flying through and, in part, creating a new Kandinsky for ourselves when we play Rez. In a sense we have become a video jockey (VJ). But aren't we also something of a DJ in Rez as well? We are making music, trance music, at the same time as creating animated Kandinskys.

This suggests to me that we reconsider transformation. Remember, we noted that Star Fox offered transformation by making us a star fighter pilot and a fox to boot. Rez doesn't offer transformation on this level but it does offer us transformation on a higher level: the transformation of becoming painter and composer, of becoming a creator of art and music and synesthetic art at that. Once again—remember how we lost our sense of self in the previous chapter—this demonstrates how central and yet multifaceted transformation is to computer games.

SUMMARY

Perhaps this is why Rez attracts such diverse responses. People who want the pure gameplaying experience might miss or deliberately ignore the connotations of the computer game as fine art form. There is nothing wrong with this. Not everyone wants their game playing entertainment to resemble an art gallery gone wild. But many do. Or rather, many want this option open to them. It is surely one of the issues that computer game designers will have to address as game player demographics begin to invade the later years of life. Game players will grow up and do all sorts of grown up things. They might well want something more sophisticated out of games, all or just some of the time. Some of us like going to art galleries, some like intelligent films that Hollywood so rarely makes, some like all sorts of music that never gets in the pop charts. Some want and others will increasingly want the choice of games on that level as well.

A question remains here, though. If Rez does indeed incorporate the aesthetics of art and music then do we have to extend our computer game aesthetics to cope with this? The answer is yes but there are problems in how to do this without cluttering up and even obscuring the particular aesthetic pleasures of interactive media that have been developed and applied successfully in this and the previous chapter. We leave this as a question for now but it will be one of a number of issues dealt with in Part II of this book.

Finally, some review of the process we have been through in this chapter and the theories applied. We started with an investigation into the activity profiles, twitch factors, and genres of the two games in question. We established a discrepancy between the media-attributed genre and the activity profile for Rez. Star Fox sat quite happily in its allotted genre while Rez seemed to be partially a *rail-shooter* and partially not. The two twitch factors seemed to signify quite different games and the activity profiles showed us that while there are similarities, the balance of overall gameplay was quite different as were the principal types of activities and their importance. Going on to apply aesthetic theory to the two games, we saw why: Rez has an aesthetic dimension to it that Star Fox does not. The simpler form of agency on offer from Rez, in contrast to Star Fox, means that players have the time to investigate this extra dimension. In support of this we also came to an interesting insight into the nature of transformation. By not being transformed as a new character but instead as an artistic creator we not only experience but become part of this extra dimension of Rez.

FURTHER READING AND TASKS

There are a number of reviews of Rez online and a very interesting and insightful one is (Rez). The interview with Tetsuya Mizuguchi already referred to is well worth reading (Mizuguchi). More on Kandinsky and synesthesia, as an art movement, can be found at the Wikipedia page on synesthesia.

As far as tasks are concerned:

1. Think about what people would play Star Fox and not Rez, or vice versa. Are the audiences for the two games so very different?
2. Choose some games that should be quite similar but maybe aren't and follow the pattern of analysis we used for Star Fox Assault and Rez. See if you can come to some real insight into why the games you have chosen are the same and why they are not. As you do this task, think about the relationship between genre, activity profiling and twitch factors, and aesthetics.

Chapter 6

Why Don't People
Play Games

The title of Part I of this book—the first six chapters—is "Why Do People Play Games?" Perversely perhaps, we are going to finish Part I by answering the question of "Why *don't* they?" It does make sense, so read on. Another reason for reading on is that this chapter also reviews the things we have been discussing so far and adds in a few new ideas to broaden the picture a little.

Some people play games, and that amounts to a very large number of people indeed. But most people don't play games. And those people who do play games only play some types of games. So, asking the question "Why don't people play games?" seems a good idea.

But the game industry doesn't seem to work this way. Games are largely made by people who know games from the personal experience of having made some already. In this sense the game industry is much like the film industry. Rigor, let alone science, at least in the sense of deciding which games to make and how to design them, must play no part. Unperturbed by this we are going to review how we have applied rigor and some science in attempting to answer exactly these questions. The fate of a whole industry depends on the answer to our questions. While meant essentially as a joke, the last statement is not entirely facetious. Most people don't play games. And as the ones who do grow older, will they continue to do so? Will enough youngsters in the following generations be as enthusiastic as were their predecessors? They will need to be if the industry is to survive in its current form. So it is a question worth answering and there are people and research groups around the world, both in the game industry and in academia, who are interested in answering such questions.

So where do we start?

WHAT DO WE MEAN BY GAMES?

Rather than start to answer our original question we will start by asking another. But it turns out that asking this question gets right to the heart of the main one. So, what do we mean by "games"? Even the terms are confusing; do we use the term "computer game" or "video game"? What about more general terms such as "interactive entertainment"?

We could decide to adopt the fairly rigid concept of computer games used by game publishers and professional reviewers. This could mean, for instance, only considering a game as a game if it gets reviewed at one of the professional review sites such as Gamespot or IGN. This is good in one respect because it means we have a coherent body of games which we understand as games; games that appear on the shelves of game shops on the high street; that appear on the "shelves" of Amazon and the like. This is exactly what we did when developing GIL. We will refer to these as "big games" when we need a collective name for them. The down side is that even playful games such as Electroplankton for the DS and other forms of interactive entertainment, Second Life for instance, get odd reviews at the professional sites if they get reviewed at all. This is because the professional review sites are written for and almost certainly staffed by hardcore players.

The alternative is that we consider a more flexible concept which takes in other forms of digital, interactive entertainment as worthy of study for our current purposes. First of all, a lot of casual games are not reviewed at the professional websites and therefore the whole casual player demographic would be excluded. As the casual demographic is a very large one, this would not seem a good idea. Secondly, there are a large number of people who take part in forms of interactive digital entertainment who don't necessarily play games at all. Second Life did get reviewed at a small number of professional review sites, such as Gamespot, for instance, as a PC game, but most of the commentary on the game has emerged from mainstream journalism in the form of documentaries and newspaper articles.

Thirdly, we might want to consider the huge, worldwide, social networking participation: hundreds of millions of people who use Facebook, Twitter, MySpace, Flickr, YouTube, Wikipedia, and the like for entertainment, relaxation and business. Social networking has gotten under people's skins in a very big way indeed; and it's definitely interactive entertainment.

Finally, and even further from the traditional game market, there are TV shows such as Big Brother for instance, which are not games at all; or so it would seem. However, many people certainly use digital media to enhance their experience of traditional mass media by participating in activities offered as core components of the reality TV genre: websites, chat rooms, blogs, votes, and so on. The audience, though audience seems an inadequate word to describe Big Brother's tens of millions of daily fans, get involved in the show in numbers and fervor even a highly successful *MMORPG* wouldn't dare to dream about.

Importantly, this more flexible, more all-encompassing concept of "game" we have been discussing will allow us to try and consider the preferences of people

who are not currently considered game players in any sense of the term but who either do, or might well, adopt other forms of interactive entertainment. A sobering fact for the games industry is that people who don't play probably still outnumber those that do. This is in stark contrast to the film industry whose audience knows almost no demographic limitations, no cultural or geographical boundaries. We will see that some of the theories we have already studied concerning the pleasures people gain from playing games already potentially include nontraditional games and nonplayers.

One conclusion seems obvious from the very start, however: adopting the more flexible view of what constitutes a game means we have to accept that the game industry is so diverse and fragmented that it does not seem to constitute a single industry at all. At a rough count we could list the following distinct industries as catering to the interactive digital entertainment (IDE) market:

- Big games
- Casual games—a number of distinct varieties and platforms
- Gambling games
- Virtual worlds
- Social networking
- Reality TV and other interactive forms of TV

Each of these industries has millions of users all around the world. It is an understatement to say that this is big business. So let us see if we can begin to answer the question "Why do people play games?" particularly in terms of the first four items on the list above.

RESIDENT EVIL

But before we go any further let's set up a working example to help us in our attempts to answer the question that is the title of this chapter. We will quickly discuss Resident Evil in terms of genre, activity profile, and aesthetics and use these as a focus for the discussions follow.

Its genre is usually given as s*urvival horror*, which is actually a subgenre of *action adventure*, for the reason that while both have similar activity profiles the particular back-story and the horror film style manifestation of the gameplay clearly identifies games, such as Resident Evil and Silent Hill, as belonging to the former.

To reinforce our comments on genre, check out the activity profile for three games from the series, shown in Figure 6.1. There are fifteen AGs scoring 2 or more which means the gameplay is quite varied. By far and away the highest scoring activity is use of weapons. There are then a closely grouped set of activities scoring between 7 and 4, in descending order: mission based, confronting, story, investigating, and unlocking items. Finally we have eight AGs scoring between 4 and 2: cut scenes, on foot, physical contact, power-ups, producing, puzzling, skill
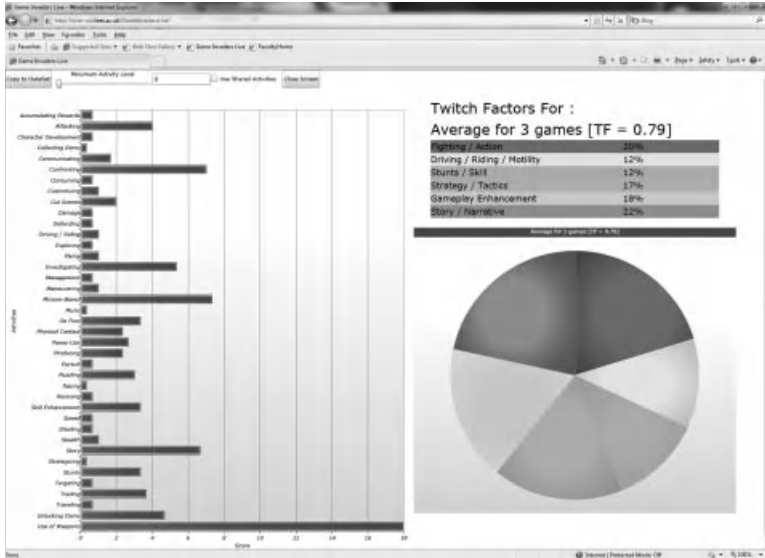
Figure 6.1   Activity profile and twitch factor for Resident Evil. (See color insert.)

enhancement, and stunts. All in all, a very typical *action adventure* profile. From the twitch factor score we see that there is a range of non-twitchy AGs which signify the game is not all twitch by any means.

 And now a brief overview of aesthetics for Resident Evil. Other than the *shooter* aspect of the game, requiring players to shoot and pick up items, although you can't strafe as in a normal *shooter*, a surprising amount of the action is carried through button prompts; quick timer events and the like. This is largely due to the cinematic style of the game: part game and part horror film. This is why this is one of the few games that people enjoy watching others play.

 Moving on briefly to other aspects of our aesthetics we can see that narrative potential plays a major role in Resident Evil on a number of levels. We have the overall back-story and its manifestation in the rampant zombies, the quick timer events, and the cut scenes. We also have the realization of narrative potential through the player's choices of how to tackle enemies and puzzles and so on.

 Transformation is strong because most of us don't spend a lot of time fighting for our lives and our civilization in zombie ridden cities. In the game we are definitely co-present with others. In fact being co-present with others who want to kill us is all part of the pleasure of many computer games. Presence is related both to the quality of the interactive content and our predisposition to enjoy particular types of games. This relates in general terms to genre and also to emotional patterns of play and player types; the latter two will be introduced in succeeding sections of this chapter.

 Okay, that was a very brief overview of Resident Evil using the three interrelated theories we have been working with. Let's move on.

WHY NOT ASK THE PLAYERS?

Now that we have our working example we can get back to the main question. And to start off, why not simply ask people who play games why they do? When Clive asked students taking his Games Futures module in October 2006 he got the following answers:

1. Escapism
2. Competition
3. Entertainment
4. Not always "fun"

This is an interesting list. Escapism and entertainment are reasons for playing games that would be common to forms of noninteractive entertainment such as feature films and novels. However, competition sets games apart from these, more traditional, forms; it's difficult to see how you could gain pleasure from being competitive in watching a film or reading a book. We take "not always 'fun'" to mean games can often be difficult, frustrating, and challenging, but this does not stop people playing them. In other words, the aesthetic pleasures we gain from games do not have to be easily gained. You could, and people certainly do, read "difficult" novels to challenge yourself. But is this a common pleasure of the medium? People don't do crosswords or Sudoku because they are easy. "Not always 'fun'" is almost certainly a common pleasure for the casual as well as the hardcore player. Being challenged is a common pleasure of many forms of entertainment. If you think about it, the word "fun" did not actually come into our aesthetics. Fun is just a particular form of pleasure.

One thing to bear in mind is that the vast majority of those taking part in this discussion were people who would be categorized as "hardcore" players in terms of International Hobo's Demographic Game Design Methodology discussed below. Many hardcore players will play a new game simply because it is new; they will take pleasure in being "early adopters" and will want to be able to express their opinions of a new game in order to continue to affirm their hardcore, early adopter status.

Responses from casual players might well be somewhat different or include other reasons. Taking into account some of the gameplay preferences of casual players and personal discussion with them, we can suggest the following additional reasons for playing games:

- Passing the time
- Learning
- Fear

By fear we do not mean in this case the fear experienced in playing frightening games (although this is itself a very real motivator for certain demographics; those who like playing Resident Evil, for instance). What we are talking about here is the fear of the consequences of not playing certain types of game. A particular example

of this is Nintendo's "Brain Age," which people play because they are afraid of "losing their faculties" and not necessarily because they enjoy playing the game.

Note that these two short lists are not mutually exclusive. The casual player might well be entertained and pleasurably experience escapism while simply passing the time. Hardcore players might well play games to pass the time but would not see that as a major reason; rather as a side effect of game playing, perhaps.

Casual players will not, on the whole, be early adopters and will have little interest in playing a game because it is new. They might play games they like that they have played for years. Many casual players, for instance, will still be playing Tetris on the Gameboy they were given by a grandchild many years ago and play only Tetris because they find the challenges it poses remain entertaining and gripping. Casual players might do the crosswords and/or play Sudoku and have no interest in finding new types of puzzles to solve.

It is important to remember when considering players' expressions of the reasons why they play games is that they might not be consciously aware of all of them. We should not be surprised by this because the physicality and participative nature of games means that many of the more basic physiological and psychological pleasures may arise quite unconsciously while still contributing to a player's overall sense of pleasure gained by playing them. It should never be underestimated just how little of our experience and understanding of the world around us is available to us consciously (Blackmore, 1999; Damasio, 2000). To make this clear it is only necessary to ask someone to tell you how he or she is able control a bicycle, or what changed in the moment when the person first learned to swim or even when the person first found him- or herself able to write computer programs. Such knowledge is expressed in our unconscious mental maps of bodily coordinations and patterns of knowledge. They are not consciously available to us; in certain fundamental ways, games are no different.

So there are different types of people and they are all complicated; they like different things from their games. But what are these things and what types of people are there? If we could relate types of people to types of games that would help us answer the question that is the title of this chapter. But first, what kinds of emotional rewards do people get from playing games?

EMOTIONAL MODELS OF PLAY

Various groups around the world are looking at the kinds of emotions people experience when they play games. For instance, Glasgow Caledonian University in Scotland has created the eMotion Lab, a facility specifically designed to allow researchers to observe players while they are playing games and to analyze the kinds of physical and emotional behaviors they display.[1]

XEODesign in the United States has undertaken similar studies observing players in their home environments and used simple equipment such as home video

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[1] http://www.gcal.ac.uk/creates/centres/emotionlab.html
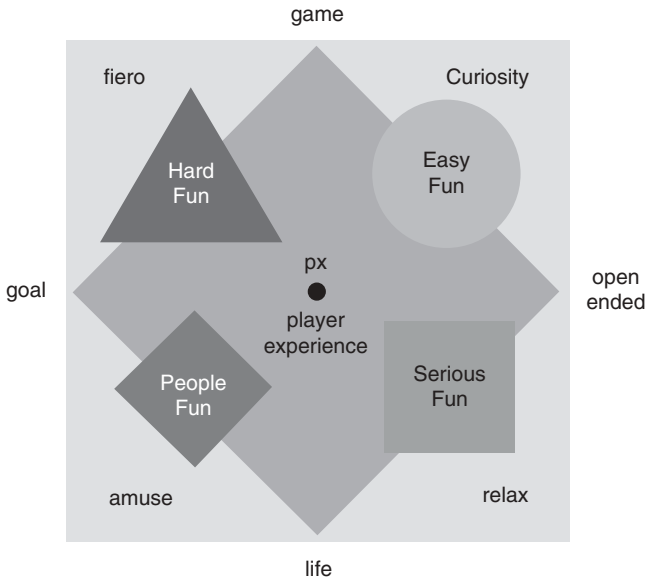
Figure 6.2   Emotional models of play. (Courtesy of XEODesign, http://www.xeodesign.com/whyweplaygames.html.) (See color insert.)

recorders to record play sessions and interviews. From their research they have built a model of the basic types of emotions players experience and the relationship of these to various types of gameplay, shown in Figure 6.2.

We will briefly overview the main elements of the diagram and relate them to our overall project, "Why don't people play games?" You can find XEODesign's own paper on this model in the bibliography ("Why We Play Games"). In that paper you can also find details of their experimental methodology, the games people played, and so on.

Xeo characterizes four emotional keys to gameplay:

- Hard fun: Overcoming obstacles, achieving goals, testing a player's skills, "the hard fun of challenge." The associated emotion is fiero or pride in achievement.

- Easy fun: Exploration; just being there, seeing what happens in the story. Curiosity is the state of mind.

- Serious fun: Altered states of mind, relaxation, feeling better about yourself. The associated emotions are excitement and relief.

- People fun: Having fun with others, either inside or outside the game. Amusement is the emotion.

You should also notice the two axes that run horizontally and vertically through the model: up/down relates to game–life axis, left/right relates to the goal–open ended axis.

The notions of hard fun and easy fun are new to this project and their relationships to particular patterns of agency—intention and perceivable consequence, and twitch factors—are well worth discussing. In general the focus on either hard fun or easy fun and the interplay between them will be characteristic of certain twitchy AGs and genres in the former case and less twitchy ones in the latter.

People fun relates to co-presence in New Media Aesthetics but adds to it the notion that such fun can be with people actually present physically as well as those present in the game world. Certain games will be more conducive to the former rather than the latter. Casual games, particularly Wii Sport and the like, are great fun played with friends around.

Serious fun relates to altered states of mind which arise as an overall result of gameplay and is thus related to presence, the overall state of mind of losing oneself in a game. Thus presence might well arise through achieving a state of relaxation, through learning a new skill or language, and so on.

So there is a relationship between New Media Aesthetics and the Xeo Designs emotional keys of games. Essentially it seems that the four emotional keys map the general New Media Aesthetics down onto particular types of games, game genres, and so on.

Notice also that Figure 6.2 also begins to point toward games more akin to reality TV such as Big Brother. We see that at the foot of the diagram that people fun and serious fun map down onto amusement, relaxation, and eventually life. Not everyone wants to face serious challenges in an artificial game world. Conversely, those who like very twitchy games that deliver a real sense of triumph will want goal-based games focused on hard fun that deliver a sense of fiero (personal triumph).

Evaluating the various characteristics of a game will allow us to move the px (player experience) marker away from the center, closer to those characteristics it most strongly exhibits. We seem to be establishing a model that allows us to identify the characteristics of the different types of games that different people like to play. But who are these people? In the next section of this chapter we discuss research into player types that focuses on this issue. But first let's see how our emotional modeling expands on our working example, Resident Evil.

For instance:

- What is the balance between hard fun and easy fun?
- How competitive is the game?
- Is social fun predominantly inside or outside the game?
- How firmly is it rooted in the game world or the world of real life?

Resident Evil strikes a fairly even balance between hard and easy fun but the easy fun is almost never relaxing; there is always the fear of being attacked. There are instances of being "safe" but these are quite rare—talking to the Trader, for instance. The game is very competitive and personal gaming skills are very important to success.

No real social fun exists as such inside the game, but the fun of being with zombies; rotting dead people that you have to kill, has a certain social edge to it

perhaps. However, as we already pointed out, due to the cinematic nature of the gameplay, there are many reports of people enjoying watching other people play Resident Evil which adds a definite social fun dimension in terms of XEODesign's four emotional keys to gameplay.

This game is not for people who like their fun relaxing, to be reality based, and to involve real people and real situations. You need to be a pretty serious gamer to enjoy Resident Evil. This sits well with the brief analysis we already did in terms of activity profile, genre, and aesthetics.

But can we relate all this to players in general?

PLAYER TYPES

Various people have attempted to categorized player types. Richard Bartle, the inventor of *MUDs*, which gave rise to *MOOs*, did some work on this (Bartle). *MOOs* probably accommodate more player types in more ways than any other game genre or single game ever made. Because of their unrivaled feature of offering players the ability to add their own content—weapons, buildings and landscapes, characters, and so on—*MUDs* quickly attracted a whole host of player types who could adapt a *MUD* to their own gameplay desires and attempt to cohabit with other player types. In fact, the clash of player types has always been one of the main problems with *MMORPGs*. From his own experiences, Richard Bartle identified four players types commonly found within *MUDs*/*MOOs*:

- Hearts: Socializers; they emphasize with other players.
- Clubs: Killers; no more need be said.
- Diamonds: Always seeking treasure.
- Spades: Always searching; for information, for example.

It is not difficult to see that we could take these four types and relate them to particular games, genres, and activity profiles. Hearts might be more interested in Second Life, The Sims and the more social aspects of *MMORPGs*. Clubs will, not surprisingly, prefer *shooters*, *racing games*, and the like. Diamonds and Spades could be expected to be more interested in *action adventure*, *adventure*, and *RPGs*.

International Hobo took this idea a step further and conducted some in-depth research to see if they could identify the main characteristics that distinguish player types with respect to computer games in general (International Hobo). We'll summarize their work.

In talking to a large number of game players, finding out their gameplay and genre preferences and getting them to fill out personality profile questionnaires, they collected and analyzed a large body of data which they mapped down onto a range of player types. Again, there were basically four: Conquerors, Managers, Wanderers, and Participants. They also found players could be distinguished by whether they were hardcore or casual players. So conquerors could be either hardcore or casual and their gameplay preferences would differ accordingly.

Let's go through them in a little more detail:

- Conquerors: People who want to win and beat the game.
- Managers: Looking for strategic or tactical challenges.
- Wanderers: Looking for a fun experience.
- Participants: Participating, joining in, very story-oriented.

Of these by far the most common type are wanderers, followed by managers, conquerors, and participants, in that order. International Hobo's methodology is described in some detail in the article as are the player types and their genre and game choices.

Interestingly, participants are the most common type in the population at large but the smallest in not only International Hobo's research but also that of Richard Bartle. People who did not play games were excluded from both surveys, deliberately in the case of the former. Putting this together with XEODesign's four emotional keys we can see that participants may well be the people who enjoy people fun and serious fun and want their fun—and their gameplay—rooted in the real world. If the game industry is to attract far more of the potential audience it needs to attract participants in great numbers, which seems to have been achieved with the nongamer-friendly technologies of the Nintendo Wii and DS, not to mention quiz style games such as Buzz on the Xbox 360.

The largest group in the International Hobo survey, wanderers, are people who "want a game to dream with." They aren't interested in finishing a game for the sake of it and will stop playing a game if they stop liking it. Games shouldn't be too hard or challenging and relaxation is important; a balance of easy and serious fun with a dash of hard fun here and there, in XEODesign's terminology. They want to accomplish something but don't want to have to work too hard for it. These people are "More interested in Toyplay rather than Gameplay" (International Hobo); "The Sims almost certainly succeeds because of C3s [casual wanderers]."

The survey should lead us to ask some searching questions about the very nature of the game industry and its aims and objectives:

- Are there enough games for the majority of the game playing public, wanderers?
- Why is the most common player type, participants, so little represented in the survey?
- Are Second Life players also computer game players? Or, are almost all the participants and many of the wanderers quite happily satisfying themselves as citizens of an alternative world such as Second Life and not at all interested in playing video games?

Second Life and its various kindred virtual worlds are in many ways the successors to *MUDs* in which you can create a place of your own to live in; can create objects, such as clothes, furniture, and houses; and can live out a life of your choosing. You are not driven by the dictates of the game.

No doubt for the majority of participants, social networking in all its many variant forms and combinations is far more attractive than any game or virtual world

could ever be. An interesting crossover is Farmville, a Facebook game which relies on social networking with other "farmers" in order to grow crops and make money. When we last checked, Farmville had over 80 million users.

We can thus see that there are, potentially at least, strong links between player types—of which we have only given the very briefest of overviews—and:

- Emotional keys: The correlation between emotional keys and player types would be quite fruitful.
- Genres: There are definite correlations between player types and genres. Some genres, such as *RTS* and *sim* games would seem to be made for a specific player type; managers, in this case. Others might well appeal to a variety of player types, perhaps unwittingly.
- Aesthetics: We have already discussed the strong correlations between aesthetics and emotional keys so aesthetics might well correlate with player types through the emotional keys.

All these map down onto activity profiles for individual games, franchises, or genres and subgenres.

One idea that does begin to emerge here is that game developers and others, such as the developers of Second Life, don't really know who they are developing for or why these elusive people play their games. Resident Evil may well be popular because it appeals to conquerors—probably deliberately, because they do approximate a large class of hardcore player pretty accurately—and accidentally, because it might well appeal to wanderers, who want story but also missions and distraction and lots of gameplay that they might never actually finish, but they will still play the game for many hours before drifting off to something else.

Many hardcore players might well find Second Life pointless, even ridiculous, and yet Second Life might well be the interactive entertainment experience ("game" is not really appropriate) that appeals to the largest groups of "game players"; either casual wanderers or participants who don't want to play games at all.

DEMOGRAPHIC RESEARCH

While International Hobo has a methodology called Demographic Game Design, we can take the idea further using GIL. By talking to members of particular demographics, finding out their game choices, and analyzing them for underlying patterns, we will discuss a particular example of the kind of research that Jo conducted. The demographic she chose was hardcore female players. By talking to such players on a particular online site she was able to establish their collective favorite games matched against an ideal activity profile for this group. The top six were:

1. Resident Evil
2. Sonic Heroes
3. Tomb Raider
4. Silent Hill

5. Castlevania

6. Legend of Zelda

These are not necessarily the kinds of games people outside the demographic would have chosen. Two *survival horror* games are in the list, two of the others are *action adventure*, and Sonic Heroes and Castlevania have been variously attributed to *adventure* and/or *platform*. We already made the link between the first two genres through activity profiling and we made the evolutionary link between *adventure* and *platform* in Chapter 2.

The next step in the research was to build a combined activity profile for the most popular games from the list above. This then produced an activity profile that represented the game play choices of the hardcore female gamer demographic. The activity profile for Resident Evil (Figure 6.1) very clearly reflects that common activity profile. Notice the top seven activities—those scoring 4 or over—are a balance of the twitchy: use of weapons, confronting, and attacking; and the non-twitchy: mission based, story, investigating, and unlocking items. The remaining, low scoring AGs, follow a similar pattern.

Jo's recommendations regarding the types of games to design and market for this demographic are equally interesting and perhaps surprising. Women in this demographic revel in confrontation and violence providing it is balanced by a strong story. These women are happy to kill; but they want a good reason. They demand a feeling of influence within the game with plenty of opportunities for exploration, investigation, and puzzling to help immerse themselves in the story. They enjoy achieving and being able to display this through skill enhancement and the use of weapons. Finally, in this brief overview, when playing as female, women want to play strong characters, not sex objects.

So that is why hardcore female gamers play games. It should be a salutary lesson to all game designers: do your research, find out what players really want, and beware of stereotypes at all costs.

WHY DON'T PEOPLE PLAY GAMES?

Probably the biggest split is between people who will spend their time playing games and those who won't. This might seem obvious, but the split is a huge gulf. There are many people for whom life is too short to waste any of it playing Big Games. However, almost all of these people will watch reality TV of some sort. Many of these people will get involved online with their favorite shows. A very large number of these people will post their photos on Flickr and spend much time putting together their Facebook and MySpace profiles; many of them might play a casual game to pass the time.

There are a class of such people who won't play games but will run simulations: Microsoft Flight Sim, various air traffic control simulators, Microsoft Train, and so on. These people will only play games if they aren't called games! For instance, if you can make real money in the "game" then it's not a game. Many people who "play" Second Life would view Big Games as frivolous and time wasting. Second

Life and such environments are real in a sense that appeals to a great number of people who also think Big Games are not. Why should that be so? Certainly for many people, not wasting time is a major concern and thus researching and designing interactive entertainment that does not waste time would seem to make real business sense.

Many more people—participants of all ages, genders, and cultures—are active on social networking sites than are ever playing online games or inhabiting Second Life. Why network with people or nonplayable characters (NPCs) descended from lizards on a fictitious postapocalyptic planet when you can network with real(er) people on Twitter? Why play a *strategy/trading* game when you can go online and actually sell stuff on eBay? Why?

Given the way the DS and Wii have been marketed and sold recently, it would seem that Nintendo are well aware of the significant number of people who find alternative forms of interactive entertainment very attractive.

Of course, really thinking about why people don't play games is very informative about all those who do. If you play a strategy/trading game it could get serious, but you can always turn the console off and walk away. On eBay you're a providing a real retail service and have to maintain value for money and customer satisfaction. You have access to local sources of new stock and generally try to keep up with your competitors. For all the reasons why people won't play games there are numbers of people who will play games; for exactly the same reason.

Finally, notice that while game genres and activity profiling apply just to games, aesthetics do not. The aesthetic model we have been using applies to all forms of digital interactive entertainment. So whatever the specific interactive medium, all users share similar pleasures and can thus be compared and contrasted on this basis.

CONCLUSIONS

At the time this chapter was written, the recession was biting hard and compounding several years of dramatic changes for both the Big Game industry and the wider casual games industry. For instance, Sony has lost its dominance of the console market to Nintendo's Wii and DS and Microsoft's Xbox 360 seems to be taking over as the hardcore gamers' console of choice. The DS and Apple's various phone and music players are going head to head for domination of the handheld market. Even Microsoft now sees the need to invest in the casual market. What is going on?

One thing that is going on is that more people who did not previously play games or engage in any sort of interactive entertainment are now playing and major industry players now see money in developing games for them. Another is that the fragmentation of the industry we noted at the beginning of this chapter is continuing. Yet another is that new business models—new to the games industry, that is—such as brokerages, Xbox Arcade for instance, are online and doing business. Nintendo does not advertise games any more. Instead, it advertises people of all ages and demographics playing all types of games and interactive entertainments on their cool

consoles in all sorts of places. The DS chart for a number of years was dominated by Brain Ages games, casual games, and interactive entertainment. Not a hardcore Big Game to be found in the top ten.

Maybe in a few years time there won't be anyone who doesn't play games or at least interactively entertain themselves, and the question that is the title of this chapter will simply be the wrong question. But finding games and interactive entertainment to satisfy such a demanding and diverse set of markets and very particular demographics is only going to get harder and harder.

One (perverse) answer to the question "Why do people play games?" is that, unwittingly most of the time, players play games in order to make it harder and harder for publishers to produce future games that people really want and that publishers can make money off of. You could think of it as players' revenge. If players don't buy and play a game then publishers won't know why. But if players do buy and play a game and it becomes really popular, publishers are little wiser. What was it about that game that made it so popular? It's still largely guesswork. So, any kind of theory, analysis, data, or knowledge that can lead to deeper insights into why some games work and others don't must surely be beneficial.

Chapter 3

Activity

In the last chapter we discussed the concept of computer and video game genre as a very general definition of game types. Specifically, we used the idea of activity types, or verbs, to characterize game genres and to help us think about the differences between these genres. What we actually did was develop a theory of computer games. In this chapter we are going use this theory and develop it into a practical model that we can use to analyze games. We will also discuss software we have developed that allows us to use this model to investigate not only genres but any meaningful set of games based on their activity profiles. In other words, this is where we start putting theory into practice.

This software is able to automatically analyze thousands of games, in terms of the activities the user performs while playing, and then it generates activity profile graphs to characterize each title. These profiles are accessed through a software client tool, Game Invaders Live (GIL), which allows people to visualize the data. In this chapter we are going to explain the way in which the game analysis process works and the general principles that allow GIL to be used as a practical tool to analyze individual games, groups of games, game genres and the whole range of genre-related concepts we introduced in the previous chapter.

A tutorial explaining in detail how to use GIL can be found online. This chapter simply acts as an introduction to the theoretical concepts that underlie GIL and their practical use in investigating computer games.

THE STORY OF ACTIVITY GROUPS

The first task in developing our software was to identify a basic set of activity groups (AGs), which we could use to build our new, more subtle classification of games. Defining a game by activity alone was going to be problematic, if not controversial, but we set about doing it anyway. So where did we start? We needed a working set of games to analyze manually in order to build up a list of AGs we could test. To make sure we had a representative group of games we chose to select them in equal numbers from the main industry-defined genres.

The genre list we used in Chapter 2, Figure 2.5, was not a very representative or wide ranging one but the concept is right. For our more detailed analysis system, we required a genre list that was more representative of the activities that players perform in-game and that covered the range of genres the activity types were particular to.

Andrew Rollings and Ernest Adams (2003) put forward a pretty concise and representative list so we chose to use this as a starting point. Let's use their genres as our first attempt to identify a general set of genres, which would thus be: *action*, *strategy*, *role playing*, *sports*, *vehicle simulation*, *construction and management simulation* (*CMS*), *adventure*, *artificial life and puzzle*, and *online*. Seems a good start but one or two of these are not really genres. *Online* isn't a genre but a technology, and *artificial life* really belongs in construction and management. So, we end up with the following list: *action*, *strategy*, *role playing*, *sports*, *vehicle simulation*, *construction and management game*, *adventure*, and *puzzle*.

Still working from Rollings and Adams, we can be more specific about what these general genres entail, as shown in Table 3.1. Many of the activities that characterize these genres are stated in general terms and not specific activity types but it does give us a starting point. To develop the list further, we amalgamated it with genres commonly used by the games press, and ended up with the following twelve definitions: *action adventure*, *action shooter*, *adventure*, *beat-'em-up*, *rhythm action*, *platform*, *puzzle*, *racing*, *RPG*, *simulation*, *sports*, and *strategy*. We then chose ten games from each—one hundred and twenty games in all—as a representative sample of the vast majority of game types. To act as a description of the game, rather than analyze the interactive media itself, we selected a number of online professional game reviews for each game, and used these to extract a working set of AGs. We realized early on that analyzing the actual playable game itself in terms of the

Table 3.1   Meta-Genres

Meta-Genre	Activity types
Action	Twitch based, hand–eye coordination, rapid response, not real thought or conscious strategy
Strategy	Building and planning, face-offs and confrontation; we need to put our plans to the test
Role playing	Advancing a story, character development, empathizing with your character, social interaction
Sports	Clearly defined, often complex rule set; winning and losing; verisimilitude
Vehicle simulation	Controlling, steering, driving/flying/sailing, time-based control maybe with some twitch, verisimilitude
CMS	Building, managing, intervening, continuing, maintaining, growing
Adventure	Exploring, collecting, manipulating, puzzle solving
Puzzle	Skill- or intellect-based, complete lack of verisimilitude, lack of story, simple but logical rule set

activities a user performs was not feasible. Recording activities automatically is still a long way past technology's capabilities and employing a manual "game tester" would be hugely expensive as well as time consuming.

Analyzing professional game reviews involved reading each review for every game and analyzing the way in which professional reviewers discussed the activities that characterized our sample game set. Developing this activity-based model was still a laborious and time consuming process but ultimately successful in providing us with a whole set of word patterns that defined the way professional reviewers talk about gameplay activity. But why do we use professional game reviews?

Professional reviewers have to describe to a potential player of the game what it is like to play, by describing the particular activities the player must undertake. Of course that is not all they talk about. Descriptions of such things as graphics and style, comparisons with existing games, and so on are also necessary. But professional reviewers have to discuss the game as a whole and not just their opinions of the best and/or worst parts of a game. There are literally hundreds of thousands of such game reviews on the World Wide Web. In the vast majority of cases, each individual game will have multiple reviews on a variety of sites across the web.

So at this stage we had a set of activity keywords and phrases that each described a particular gameplay activity group, and from a wide range of genres. By automatically searching for these keywords and phrases within online reviews, we could use this model to characterize games by their activity groups, not just their given genre. The next task was to develop a prototype software system that could perform this analysis automatically to see the kind of activity group (AG) characteristic data it would generate. We ran the software on the same game reviews, checked the accuracy of the results, refined the model, added new activity keywords, phrases, and AG definitions, and then repeated the process again and again until we were happy with the results.

As a result of this refinement we eventually arrived at 49 AGs, comprised of a multitude of keywords and phrases, which in various combinations characterized any game we could throw at the model. These can be found in Table 3.2. We were then ready to run the analysis software on a larger set of data: as much data as we could possibly find. So we wrote software to collect URLs for as many online professional game reviews as it could possibly deal with; hundreds of thousands of reviews for tens of thousands of games.

Now we could run our game analysis software on all of these professional reviews, with each game's review linked by the URLs collected. We fed the results of this analysis into our database, which gave us a gameplay activity profile for each game we had found reviews for. These activity profiles consist of a set of AGs that reviewers found more or less important for each game. Although they will not have mentioned the activity group itself, the activity keywords and phrases that define each AG will have been mentioned numerous times in order to get a positive result. The software calculates how importantly each AG is regarded by counting the total number of *any* words in *all* the reviews for each game analyzed and compares this to the number of references found for each AG. These two numbers give us a measure of the relative importance of each activity within the game.
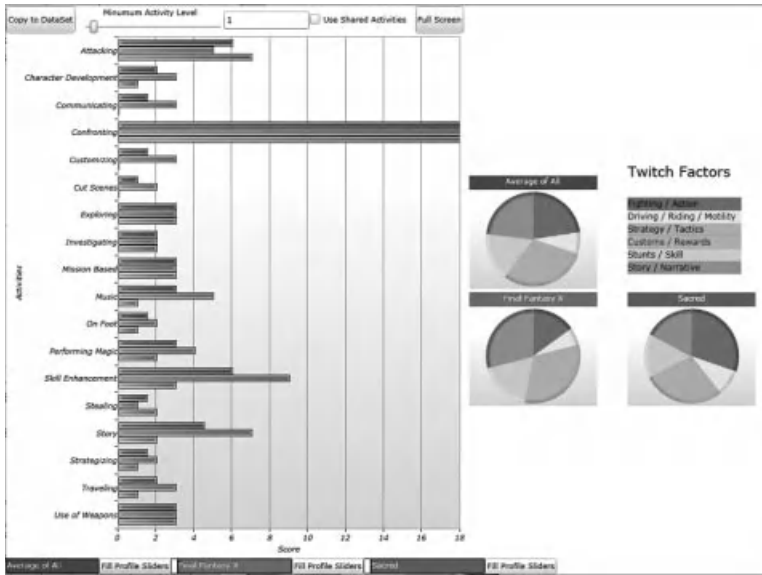
Figure 3.1   Activity profiles for Final Fantasy X and Sacred. (See color insert.)

These activity profiles are a bit like the activity profiles for the set of genres we developed in the previous chapter and for Adams and Rollings' general genres, except:

- there is one for each game; and
- instead of someone guessing what activities have what importance they are calculated from professional reviewers' assessments of games.

An example of activity profiles for two RPGs, Final Fantasy X and Sacred, can be found in Figure 3.1. You'll see that 18 AGs are needed to represent the two games. Of these, 15 were shared by both games and three are found only in Final Fantasy X.

Because both games are *RPGs* you would expect them to share a lot of AGs in common. In particular, the highest scoring activity—the longest horizontal bar on the chart, confronting—is common to both and gets the highest score for both. However, as we go down through the lower scoring AGs we see that the overall profile for each game is somewhat different. FFX has four other AGs scoring over 5, while Sacred has only one. The only one they share at this level of importance is attacking, a very "twitchy" AG. We'll use the term "twitchy" to refer to AGs requiring fast reflex responses from the player as opposed to slower, more measured activities. Twitch factor (defined below) measures how twitchy a game is overall.

FFX also has high scores for three other AGs: skill enhancement, story, and music, which are three non-twitchy AGs. Thus already we can see that Sacred is a more twitchy game than FFX and this is reflected in the twitch factor pie charts and the overall twitch factors of 1.16 and 0.55 respectively.

For AGs scoring 3 to 5, the two games share exploring, mission-based, and use of weapons, all of which are twitchy AGs. Of the AGs they don't share in the 3 to 5 score range, FFX has performing magic, character development, and traveling, the first two of which are non-twitchy; while Sacred has just one, skill enhancement, which is also a non-twitchy AG.

Of the three AGs that FFX has but Sacred doesn't, communicating, customizing, and cut scenes, all three are non-twitchy. The only AGs for which Sacred scores higher than FFX are attacking and stealing; both classed as twitchy.

All these activities in both profiles are characteristic of *RPGs*, including all the lower scoring AGs we haven't discussed. All in all we can observe that while both games have very typical profiles for *RPGs*, they are in fact different to a degree. Remember, we said this about genres in general. Games that belong to the same genre will be very much the same and yet different as well. Sacred scores lower on the skill enhancement, character development-type activities so typical of *RPGs* and scores higher on fighting-type activities. In this respect FFX actually conforms rather more closely to the typical *RPG* profile than Sacred does.

In fact, *RPGs* are the most complex of games in terms of their activity profiles, and a typical *RPG* will have around twenty or more AGs in its profile.

But we didn't stop there. We did some data warehousing; we analyzed the data we already had in order to look for patterns that could generate even more data—meta-data, if you like. One thing we did was to compare the activity profiles for every game to every other game and feed those results into the database. This is called a correlation matrix and makes it really quick and easy to see how similar two or more games are or aren't. It allows us to do other things as well, such as find games which have the closest activity profile to the one selected. As you'll see later, this cuts across genres and looks at games in a far more fundamental way.

So that's the basic story behind GIL and profiling games on AGs. It is not perfect but it is a very useful and unique resource for educators and students, developers, publishers, journalists, and anyone else with a professional interest in computer games. In the rest of the chapter we are going to study the practical applications of GIL and the various applications of activity profiling. In doing this we'll also revisit what we found out about game genres in Chapter 2 and see how we can use these new techniques and all this new data to turn guesswork into empirical support for the intuition and creativity of game developers.

AN OVERVIEW OF ACTIVITY PROFILES

Before going on to put activity profiles into practical use we'll look in a little more detail at the activity groups and some of their characteristics. In Table 3.2 you'll find all the 49 AGs. We've also clustered these AGs into sets based on their gameplay characteristics, so we can see if there is any pattern to them. In Table 3.2 we've divided the 49 AGs into six basic groups concerned with: fighting, driving/riding, stunts/skills, strategy/tactics, gameplay/enhancement, and narrative. The first five should be self-explanatory but the last might seem a little odd. Cut scenes, music,

Table 3.2 The 49 Activity Types in Their Twitch Categories

Fighting	Driving/ Riding	Stunts/Skills	Strategy/Tactics	Gameplay/ Enhancement	Narrative
Attacking	Driving/	Dancing	Building	Accumulating	Cut
Capturing	riding	Manipulating	Commanding	rewards	scenes
Confronting	Flying	Maneuvering	Communicating	Character	Music
Damage	On foot	Performing	Consuming	development	Story
Defending	On rails	magic	Exploring	Collecting	
Physical	Racing	Power ups	Investigating	items	
contact	Sailing	Skill	Management	Customizing	
Pursuit	Swimming	enhancement	Mission-based	Unlocking	
Targeting	Speed	Stealing	Producing	items	
Use of		Stealth	Puzzling		
weapons		Stunts	Rescuing		
Warfare			Strategy		
			Trading		
			Traveling		

and story might not appear activities at all at a first glance but if you think about it you have to watch a cut scene, listen to music, and work out what the story of the game is. These are all activities that you take time to perform during the gameplay process but they are more akin to traditional media such as film or TV in that you don't have to do anything to directly control them. Music can be the odd one out in this case, as there will be skill involved in creating the music within *rhythm action* games, although you may still be listening to the music that you create as part of the narrative.

Looking at the breakdown overall we see that strategy/tactics has the most AGs by far (27%) followed closely by fighting (20%), stunts/skills (18%), driving/riding (16%), gameplay/enhancement (10%), and narrative (6%). This doesn't mean you'll find strategy/tactics-type activities most often in activity profiles. It just means that reviewers needed a lot more AGs in order to describe games with these types of activities in them. In fact, most games will have fighting-type activities in them even though that might not include use of weapons and such like. Many games will also have passive activity types in them as well, even though there aren't very many of them.

The rapid reaction group consists of fighting, driving/riding, and stunts/skills, whereas the more measured group of characteristics includes strategy/tactics, gameplay/enhancement, and narrative. We find that 55% of activity groups fall into the former category and 45% the latter, so although there are more rapid response, twitch-type activity groups than there are more measured ones, this proves that there is a lot more to games than just fighting.

The twitch factor is a further measure we can derive from a game activity profile. Basically, we calculate an overall score for the rapid reaction group and the

more measured group and divide the former by the latter. A result greater than 1 represents a twitchy game to some degree, while a result less than 1 signifies a more measured overall style of gameplay. As well as providing an insight into the game itself, the twitch factor also helps to identify what type of player might enjoy the title and goes some way to establishing why they would play the game.

Once again it is important to note that while these AGs are derived from the writings of professional reviewers, they have to describe what the player actually has to do in a game and so are not just the whim of the reviewer. AGs are derived from the gameplay programmed into games by game developers based on the concept and game design documents agreed on with publishers.

THREE DRIVING GAMES

In the previous chapter we looked briefly at two driving games, Wreckless: The Yakuza Missions and Colin McRae Rally 2005. Now we can take another look at these games, but in far more and more reliable detail; in GIL detail. We'll also throw into our analysis Gran Turismo 4, a classic racing game. Using GIL we can easily generate the activity profiles, Figure 3.2, for the three games and begin to see what these games do and don't have in common.

All three games are *driving/piloting/crewing* (*DPC*) in our GIL mapping of known genres. But their profiles are quite different even in terms of the highest scoring AGs. Remember what we said in Chapter 2 about the driving genre; it is a meta-genre, sharing only some major AGs. We can now use activity profiles to give an idea of just how diverse the genre can be.
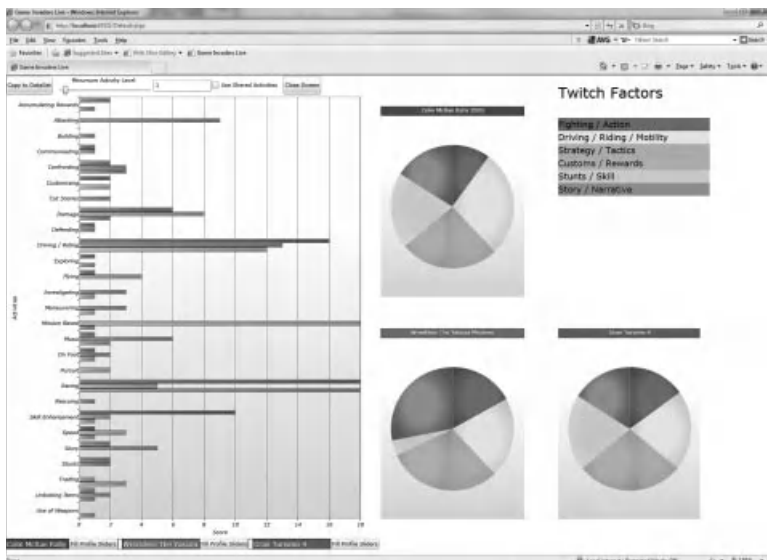
Figure 3.2   Activity profiles for three racing games. (See color insert.)

One simple but interesting comparison is to simply count the number of activities in each profile or to count those activities that score over a certain threshold. If we just count those activities that score 2 or more in the three charts we see that the Colin McRae and Gran Turismo have a similar complexity rating with nine and seven AGs scoring over 2 respectively, while Wreckless has 17. So, Wreckless is a more complicated game than the other two and that is borne out by the reviews. But what do the differing activities tell us about the Wreckless and the other two games?

If we work out a simple twitch rating, twitchy activities versus the more measured ones, we get the following:

- Colin McRae Rally 2005: 1.05, slightly twitchy
- Wreckless: The YakuZa Missions: 1.06, slightly twitchy
- Gran Turismo: 0.88, less twitchy

Now look at Figure 3.2 to see all the activities for the three games laid out against each other. All of the games have only one highest scoring AG; this is racing for McRae and Gran Turismo and mission-based for Wreckless. They all share driving/riding as their second most important activity. Immediately we see that Colin McRae and Gran Turismo seem to be quite similar while the Wreckless is already looking very different. Just looking down the rows we see that, including driving/riding, the three games have similar scores for only five AGs: accumulating rewards, confronting, driving/riding, speed, and unlocking items. But these are all low scoring AGs apart from driving/riding. However, even if we compare Colin McRae and Gran Turismo we see that apart from racing and driving/riding they only share two low scoring AGs. For some medium scoring AGs, they are quite different. Colin McRae scores well on skill enhancement and damage while Gran Turismo does not. In fact, Gran Turismo has only two high scoring activities, which it shares with Colin McRae, but it does score moderately on trading, which is a strong element of the game where you attempt to trade up your car in order to win races and enter higher categories of races and advance your career mode.

Wreckless has a number of medium scoring AGs all to itself including attacking, investigating, music, story, and maneuvering. The first four, along with mission-based, are consistent with *action adventure* games, which is what Wreckless actually is: an action adventure game where you drive. Wreckless is a very different game. It is very strong on both twitch and non-twitch AGs, which means that story is as important as the driving element. It is fairly strong on fighting and strategy/tactics AGs but also represents gameplay/enhancement and stunts as well.

What conclusions can we draw from this? Colin McRae is a very focused game, driven, pun intended, by being rewarded for the exhibition of driving skills and vehicle setup. Set the car up right and drive it right, then you'll win. Gran Tourismo, while still being a driving game focusing on racing, presents players with a broader range of activities which take it into strategy/tactics, career development, and trading, and it has a strong music element. Wreckless is a very different type of driving game,

racing is relatively unimportant unlike story which is as important as driving. This, in conjunction with the strategy/tactics AGs and two fighting AGs, make for a *driving* game with a strong *action adventure* bias.

There would appear to be a lot of leeway here for developers of driving games. Even the two that appear quite similar have significant differences. We can see that only two or three AGs hold this genre together. It is probably the case that driving has such a strong pleasurable pull for so many game players that they will enjoy playing all sorts of games containing these AGs. *DPC* is indeed a meta-genre in the sense that the games it subsumes have so diverse a range of game genres.

In terms of the three driving games we just compared, there is a simple but general technique for using GIL and it's worth taking a few moments to think about it. The technique is this:

1. Select your games and decide which versions of them you want to analyze. Remember the same game name on different platforms might be very different; PS2 and N-Gage, for instance.

2. Save as a Data Set.

3. Export the Data Set as XML.

4. Feed results into a spreadsheet (supplied separately) so that you can see how individual AGs match up. Keep it simple by only using AGs that score 2 or more. Hide the unused rows.

5. Count the rows that match up exactly and then those that are close—high and medium or medium and low. Count the rows that don't match and use these figures as a measure of how close the games are. If the high scoring AGs don't match then the games are probably quite different. If the differences are just in the low scoring AGs then the games are probably a variation on a genre or subgenre.

6. Look at the balance of AG types to get an idea of the kinds of gameplay involved. The twitch factor can also be helpful here.

There are literally tens of thousands of games published to date. You can't play them all. But using this technique you can very quickly get to know games you've never even heard of, let alone played. You'll also gain new insights into games you thought you knew. We've been doing just this for many years now and believe us, it works.

In Chapter 6, "Why Don't People Play Games?" we'll make a stronger link between AGs and various characterizations of player types, emotional patterns of play, and so on. But for now we are going to move on to see how AGs help us to take a more rigorous look at the observations on genre we discussed in the previous chapter. We'll construct an activity profile for all the main genres. One of these will be the *DPC* genre; so we can see how our three drivers compare with their genre as a whole.

Will it turn out that *DPC* is unusual in its diversity; are the other genres more cohesive? *Shooters* are going to be pretty straightforward; aren't they?

CALCULATING GENRES

We are going to use GIL's AG profiling ability to calculate genres. It's actually quite easy. First we'll tell how to do it and then we'll take a look at what the results can tell us about game genres.

In essence the technique is easy: to calculate a genre we analyze a set of games that are representative of that genre. In fact, GIL will give you an average profile and twitch factor for any selection of games, including a representative sample of RPGs, for instance, but the analysis we're going to do now will be a bit more subtle.

Activity profiling of genres not only helps to better understand particular game classifications and gameplay itself, but it also acts as a measure that can be compared throughout all the genres present in the GIL software. By defining genres based on their activity group levels of importance, they can be measured against each other so their relative relationships can be calculated based on hard data, rather than opinion.

The outline for this analysis process is as follows:

1. Define the genres to analyze.
2. Select games that characterize each genre.
3. Record each activity group that registers for each game.
4. Record the levels of importance for each activity group (high, medium, and low, only taking the first five highest low activity groups to reduce any margin for error).
5. Calculate the most common activity group levels of importance for each genre (high, high/medium, medium, low/medium, and low).
6. Compare each genre's common profile against all others by scoring those that match on activity and level of importance (1 = matching activity group; 2 = half a match, e.g., high/medium and medium; 3 = full match, e.g., medium and medium).
7. Finish with a matrix of genre relationships enabling a genre map to be produced.

We'll go through each of these in a little more detail.

(1)   Define the Genres to Analyze

This analysis uses all twelve genres used to kick start GIL's activity group hunt, although *action shooter* has been changed to *shooter*, *beat-'em-up* is now *fighting*, *racing* has been more broadly defined as *driving/piloting/crewing*, and *rhythm action* is *rhythm action/music/party*.

Genres selected for comparison are therefore:

- *Action adventure*
- *Adventure*
- *DPC*

- *Platformer*
- *Rhythm action/music/party (RAMP)*
- *RPG*
- *Shooter*
- *Simulation*
- *Sports*
- *Strategy*
- *Puzzle*
- *Fighting*

(2) Select Games That Characterize Each Genre

The 20,000 games in GIL are defined by about 400 different genres in the games press! Needless to say, this figure is far too large to enter into a dropdown list for users to search by. We therefore group the genres under twelve recognizable but general ones and a catch-all, *Other*, for those that just don't seem to fit anywhere. For example, "*computer role playing*," "*fantasy online role playing*," "*persistent online action RPG*," "*RPG compilation*," and "*turn-based RPG simulation*" are all classed as the *role-playing game* genre.

However, some of the genre definitions given by the game review websites may not be appropriate to describe the game. For instance, a "*sci-fi adventure game*" could easily be classed as a "*sci-fi action adventure*," and so would be placed in the wrong genre by our harvesting software.

For this reason, the website Wikipedia came in handy as their game genre definitions have been agreed upon, or at least not disagreed upon, by its many millions of users.

The articles accessed included:

- "List of first-person shooters"
  http://en.wikipedia.org/wiki/List_of_first-person_shooters
- and "Category: Action-adventure games"
  http://en.wikipedia.org/wiki/Category:Action-adventure_games

In total, the number of games across the twelve genres is 203, varying from 12 to 28 games per genre. Any potential difficulty caused by the difference in figures was solved by using percentage values to calculate any commonality between activity groups and genres.

(3) Record Each Activity Group That Registers for Each Game

Using GIL, individual charts for each game or game series were created and saved. They then could be viewed as a data set.

Table 3.3 Selection of Raw Data

(4) Record the Levels of Importance for Each Activity Group

An Excel spreadsheet was used to record each of the activity groups in each game-play activity profile, along with their individual levels of importance.

GIL automatically bands the activity group levels of importance for each game-play activity profile. The range is high, medium, and low; separated by smaller bands of 18. When GIL profiles more than one game, it bands the profiles relatively by taking the highest values for each game and bringing each up to 18. The data can be exported from GIL using the Export to Excel button on the Data Set Tab. Table 3.3 shows a section of the raw exported data.

(5) Calculate Common Activity Group Levels of Importance

To establish the activity groups and the importance of particular activity groups within a genre, the percentage of frequency (how often the AG appears in the selection of games within a genre) is calculated for each activity group within particular levels of importance. The most common levels of importance for an activity will have a higher percentage frequency.

Table 3.4 shows a section of the Excel sheet for the *action adventure* genre. For the activity group "confronting," God of War and Shadow of the Colossus both register a high level of importance for this activity group. In total, the number of games that had the confronting activity was 11 (seen in row 2, column P). The total

Table 3.4 Section of the Excel Spreadsheet

	A	K	L	M	N	O	P	Q	R	S	T
1		God of War	Shadow of the Colossus	TOTAL H	TOTAL M	TOTAL L	**NO. AGs**	TOTAL H	TOTAL M	TOTAL L	MOST COM.
2	confronting	H	H	8	2	1	11	72.72727273	18.18181818	9.090909091	H
3	attacking	H	L	3	5	3	11	27.27272727	45.45454545	27.27272727	M
4	puzzling	M	L	1	6	2	9	11.11111111	66.66666667	22.22222222	M
5	use of weapons	M	L	2	4	3	9	22.22222222	44.44444444	33.33333333	M
6	exploring		L	0	1	4	5	0	20	80	L
7	traveling		L	0	0	1	1	0	0	100	L
8	investigating		M	1	3	5	9	11.11111111	33.33333333	55.55555556	L/M
9	maneuvering		M	0	2	2	4	0	50	50	L/M
10	defending	L		0	2	1	3	0	66.66666667	33.33333333	M
11	music	L		0	1	5	6	0	16.66666667	83.33333333	L
12	performing magic	L		0	0	2	2	0	0	100	L
13	stunts	L		0	5	5	10	0	50	50	L/M
14	story	M		0	6	3	9	0	66.66666667	33.33333333	M

of games with confronting as a high activity was eight and therefore the activity group confronting has a high level of importance 72% of the time in the *action adventure* genre (seen highlighted in column Q). This also means that the most common level of importance for the confronting AG in the *action adventure* genre is high (seen in row 2, column T). The same process was carried out for all of the activity groups for each genre, with the result being individual genre activity group profiles.

(6) Compare Each Genre's Common Profile

To measure the closeness of the relationship between each genre, each genre's activity group profile (selecting only the activity groups seen in at least one third of the games per genre) was pitted against the others' to see where there was some similarity.

Valuing this similarity involves scoring a full, half, and activity group (AG) match based on level of importance:

- Full match = 3 (e.g., H and H)
- Half match = 2 (e.g., L/M and M)
- AG match = 1 (e.g., L and H)

The final score values how closely the genres are related: the higher the resulting score, then the closer the relationship between the genres.

(7) Finish with a Matrix of Genre Relationships

The end result is the matrix of genres against genres shown in Table 3.5. The lower numbers signify less of a match with other game genres and two stand out more so than others.

The *adventure* genre shares some relationship with the *action adventure* and *platformer* genres, and little or no connection with others. The major reason for this is that adventure games have few activities but high levels of importance, which other genres find it difficult to compete with. These activity groups are:

Table 3.5 Matrix of Genres Against Genres

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Action Adventure	Adventure	Driving/Piloting/Crewing	Fighting	Platformer	Puzzle	Rhythm Action/Music/Party	Roleplaying	Shooter	Simulation	Sports	Strategy
2	Action Adventure	12		9	13	32	9	3	22	17	17	14	10
3	Adventure	12		6	4	12	5	1	9	4	9	7	1
4	Driving/Piloting/Crewing	9	6		7	9	5	7	7	1	11	12	4
5	Fighting	13	4	7		7	13	3	13	6	7	13	8
6	Platformer	32	12	9	7		13	7	21	15	23	23	16
7	Puzzle	9	5	5	13	13		6	14	8	10	13	10
8	Rhythm Action/Music/Party	3	1	7	3	7	6		5	2	5	5	7
9	Roleplaying	22	9	7	13	21	14	5		14	18	16	16
10	Shooter	17	6	1	6	15	8	2	14		15	12	11
11	Simulation	17	9	11	7	23	10	5	18	15		22	17
12	Sports	14	7	12	13	23	13	5	16	12	22		9
13	Strategy	10	1	4	8	16	10	7	16	11	17	9	

- Communicating = Medium
- Investigating = High/medium
- Puzzling = High
- Story = High/medium

The *puzzle* genre has high puzzling but lacks in the other activities. *Platformer* has high/medium investigating but fails to match, with no communicating and low/medium story.

Another case is *rhythm action/music/party* which, again, due to its high values on a small number of activities makes the game difficult to match against, so it stands alone as a genre.

One genre that clearly has a strong relationship with another is the *action adventure* genre with the *platformer* genre. This is because they are pretty much the same genre but one has particular level design conventions that the other tends not to, that is, platforms.

Simulation is also an interesting genre as it matches with *platformer*, but largely because the genre incorporates so many activity groups, meaning that a number of genres can be classed as *simulation*, particularly *driving* and *strategy*. Flight simulators lack the mission-based content that most drivers have and combat flight simulators have too much attacking and confrontation, so are actually closer to *shooters*.

Animal Crossing is a *life simulation*, or is it a *communication simulation*, or is it a *strategy* game? Monster Rancher is also a life simulation but also includes confrontation as well as production and skill enhancement; characteristics of the *strategy* genre.

The only way to determine subgenres without contention is to compare a large number of games by their activity profiles and determine where there is correspondence between the games.

(8) Genre Relationship Map

To visualize the relationship genres have with each other, a simple map, Figure 3.3, can be created using lines to link genres. In this map the stronger the correspondence between two genres in terms of activity, the closer they are positioned with respect to each other.
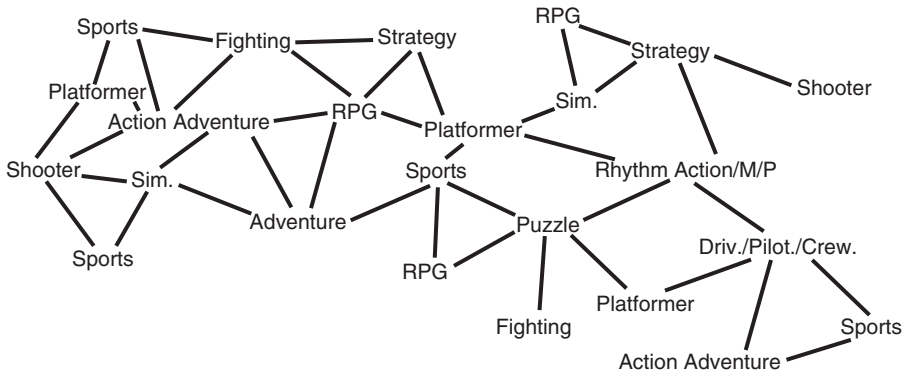
Figure 3.3   Genre relationship map.

Only the top five closest similar matches for each genre were included, but as two genres may share a characteristic but one will rate it in the top five and the other does not, there will be some duplicates. Also, to create a map with only twelve genres labeled once would produce a complicated spherical shape that would be difficult to visualize. But looking at the relationships between genres gives you plenty of food for thought. Take a look, for instance, at the relationships the *sports* genre has with others. It appears four times and has close links with seven of the twelve genres but its closest link is with *platformer*. Conversely, *adventure* appears only once and has fairly distinct links with only *sim*, *action adventure*, *RPGs*, and *sports*. DPC is similarly out on its own to some extent.

SUMMARY

The theory from the previous chapter was that games are characterized by the activities you perform when playing them. In this chapter we showed how that theory could be made very practical by a model—the 49 activity groups—in software. This also allowed us to calculate twitch factors for games and groups of games. Comparing activity profiles is a great way to gain an understanding of games you haven't even played, as well as to gain deeper insights into games you know. Comparing activity profiles allows you to compare games in detail and to compare them against an average profile of a set of other games, from the same genre for instance. We also showed you how to do a more detailed comparison between genres and to generate a map of the relationships between genres. Activity profiling is a powerful and practical way to gain insight into what games are and how they compare with others in a more rigorous manner.

In terms of the question that names Part I of this book, it should also be clear that there are various reasons why people play different types of games:

- Different types of activities will appeal to different types of players. Games that feature communicating, character development, and story will not be popular with people who want to be fighting all the time.

- Twitchy games will appeal strongly to some people and be quite offputting to others.
- A balance of twitchy and non-twitchy activities—as in *RPGs* and *sims*—will be a strong draw to those who want a bit of twitch now and then but also like having time to think, puzzle, and plan.

Achieving the right balance of AGs to match the kind of twitch factor required of a game is not an easy business and if you look at the activity profiles for different genres you will see that you cannot just mix and match AGs as you see fit. AGs seem to come in groups depending on the genre of the game and so on. There is certainly much food for thought for you here; but, of course, that is one of the main aims of the book.

TASKS

1. One insightful way for the reader to start using GIL is to select a number of games you have enjoyed playing and take a good long look at their activity profiles. Are there any common features in the profiles? Are there activities that seem to capture what it was that you found pleasurable in the games?

2. Now take a selection of games you wouldn't dream of playing and take a look at their activity profiles. Again, look for patterns and/or recurring activities. From 1 and 2, what have you learned about your game preferences? Be honest with yourself here; you'll learn far more.

3. Take a look at a set of games from a franchise. Are the profiles mostly fairly similar or is it just a character, backstory, or other form of license material that holds them together? Try to identify a franchise that has a consistent activity profile across all or most of its games.

Part II

What Is a Game?

Chapter 7

Just an Ordinary Day

It's just an ordinary day. You're walking down a street near the middle of town. There is absolutely no one else around, or so it seems. Suddenly bullets ricochet off the walls and sidewalk around you. First things first; you need to find cover: down some steps, behind a low wall, down an alley? You're crouching down behind a low wall out of harm's way for the moment. Not too badly hurt, health looks okay. Where is the shooting coming from? You use the path of the incoming bullets and tracers to find out where your attacker is. You can just about make out someone way up above you on a parapet. You check that you've got enough weapons and ammo. You've got to plan your way out of this. Fighting back from down here is not going to be easy. You can't stay where you are. You need a safe vantage point. You need to get this guy.

Later on in this ordinary day you're scuba diving, trying to find your way into some sort of underwater building, but more of that later. Later still in this ordinary day you are driving through town on the wrong side of the road, way above the speed limit. You notice a line of police cars blocking the road in front of you and you also notice a psychotic looking police car in your rear view mirror. You can't turn round because the police in your mirror will ram you and that will probably be the end of it. Your attention is drawn to a small gap between two of the police cars ahead. You might be able to get through without too much damage to your car. That's the only option. Make for the gap and hope your driving is good enough to get you through. You just planned your way out of this. It's turning into quite a day!

No surprise, the shooting incident is from an *FPS* or *shoot-'em-up*. It's SinCity, a death match (DM) level from Ritual Entertainment's Sin. Being an *FPS* DM level, this is a first person, multiplayer level with guns and ammo, health and power-ups floating around just above the floor. Being a DM level the setting is constrained, not to say claustrophobic; you really can't run and you really can't hide. Bullets and ricochets naturally attract your attention, as do a few moving pixels which signify an opponent at some distance. Keeping well armed and up high are good tactics and the major activity is the firefights. The pace is determined

by the players, so playing SinCity can sometimes be about measured and stealthy activities while at other times it's fast and furious. It's usually fast and furious; very twitchy, in other words.

Your scuba diving trip was made possible by AS-OceanFloor, an assault level from Unreal Tournament. The consequences of your less than sensible driving habits are provided by Driver from Reflections. This is a first or third person single player *driving* game with the whole big, bad city for you to play in. There are no weapons or power-ups to collect but you've got a dynamic local map to help you. You do have a weapon of sorts, however: your car. Everything around you is pretty natural except the big red arrow you know is out there somewhere signaling you've reached the objective for the level. Keeping your car free from damage is a good tactic. Not getting noticed by police is also a very good idea though not always possible given the time constraints you have to work with.

Think about SinCity and Driver for a moment. Two very different games: different genres, very different game plays, differing intentions and perceivable consequences, differing narrative potentials. Notice that GIL only has activity profiles and twitch factors for whole games, not for individual levels or missions, but again, these will be quite different for the two games.

Yet somehow the situations are very much alike. You are suddenly in great danger and have to find a way out or lose and start all over again. You can take pleasure in using your skills, both motor and intellectual, to keep failure at bay. You also have to recognize the possible way(s) out offered within the content of the game. That is a part of the skill set you have. These are some of the generic pleasures of games. So, on the one side, the pleasures, we have similarities; while on the other, genre, we see almost no similarities. It would be useful to know in more detail why the situations are so different superficially and yet similar in some sense under their skins of pixels. Are there general structural similarities, principles that we could apply to all games?

Rather than pursue the kind of generic analysis we conducted on Rez and Star Fox in Chapter 5 we are going to look at game content directly. We are going to look at particular elements of the game world and see how they enable gameplay and affect the aesthetics of games. And, as importantly, we are going to generalize all this in order to arrive at an abstract theory of computer game content.

Perceptual opportunities (POs) is a theory of the content of computer games and virtual environments—another name for virtual reality—in general which aim to consider the basic mechanics of gameplay (Fencott, 2001, 2003). POs address game content at a fairly low-level, moment by moment and will complement our previous studies of genre, activity profiling, and aesthetics. In this chapter we will use POs to dissect SinCity and then go on to consider an AS-OceanFloor; just to see how we can distinguish between two levels that are both *FPS* and yet have a different feel in terms of gameplay. In the following chapter we will consider Driver in some depth and then relate SinCity and Driver in terms of what we have learned by applying POs.

But first a power-up.

THE GLASS VIAL

It is easy to see that a variety of quite different objects to be found in quite different games serve similar purposes in terms of gameplay. Static police cars in a road block and ricocheting bullets serve the same basic purpose of attracting our attention to some problem, puzzle, or hazard that has to be solved or overcome in order to progress with the game. Our attention is attracted to particular objects and groups of objects because of what they mean in the particular context of the game we are playing and understanding of its genre. Having had our attention attracted we then have to formulate an (aesthetic) intention to solve the problem, to avoid it, or take whatever course of action is necessary. Objects we perceive around us, or whose existence and whereabouts we remember, will take on special meanings in our quest to resolve the current problem that is the focus of our intentions.

We can identify two types of meanings that we give to objects. In the "real" world, objects are predominantly *denotative* in meaning. They are themselves and function as expected: a cup is a cup, a chair is a chair, a glass vial is a glass vial, a door is a door, a neutron disrupter cannonade is a . . . and so on. You can drink from the cup, sit on the chair, and open the door if you have the key. Neutron disrupter cannonades don't exist in our world but they would still denote themselves if they did. Sometimes objects also have *connotative* meaning as well. We use them to make associations less obviously connected with their everyday nature or function. Souvenirs and mementos are examples of this. A holiday snapshot brings back to mind all sorts of memories and associations that we might well have forgotten about; connotations that in such cases are specific to the people present when the photo was taken. Clothes are another example of everyday objects with connotative meaning. We choose clothes not merely for functionality but for what we would like them to say about us in different situations to different people. Getting the dress code right can be very important at times: at job interviews, weddings and funerals, or beach barbecues, to name just a few.

On the whole, denotative meanings, the thing itself as itself, dominate our perception of the real world because that is how one uses objects to do one's job, earn one's living, feed oneself, and generally survive and, hopefully, prosper.

In computer games, objects also have the potential for both denotative and connotative meaning but it is their connotative meaning that is particularly important. A gun is still a gun and has its denotative value as a weapon of offense or defense but many more objects than in the real world will have connotative meanings to do with gameplay, strategy, and winning and losing. Think about a chair, a very ordinary chair, the sort you find everyday in coffee shops, restaurants, and dining rooms. In a game this chair could be used to sit on—a very unusual possibility from our knowledge of games. More likely, you might be able to pick it up and use it as a weapon. In an *adventure* or *RTS* game it could more likely be used to stand on to reach an object that in itself has connotative meaning. The ordinary chair you just imagined has many possible connotative meanings in the gameplay process. The glass vial on the shelf high above you might be a power-up. The key you can just reach after standing on the chair might unlock a door that gives you access to the

treasure chest. Even such mundane objects as walls, floors, and ceilings become not just corridors but objects in the gameplay that restrict your choice and lead you on to confront the next situation. When playing games we are constantly on the lookout for such connotative meanings.

UNREALISMS

It is exactly these "other" meanings, connotations, that POs are designed to allow us to consider, but before talking specifically about POs let's think a little about what Poole calls "unrealisms" (Poole, 2004) but which have been identified by various other people under differing names. Denise Whitelock, for example, used the notion of "specifically defined infidelities" (Whitelock et al., 1996), "infidelities" here meaning aspects of games that are deliberately designed to be unreal rather than perceptual bugs that get in the way of the gameplay.

The idea of unrealisms is that any computer game will distort the reality it is based on in order to make the game playable, in order to offer the aesthetic pleasures players will expect of it. Such unrealisms might be cars that seem to stick to the road and don't seem to get damaged easily, visible laser beams from laser guns, the ability to jump off of 50-foot-high buildings and lose just a little health, and so on. They might also be various elements of the interface that aid gameplay. For example, rearview mirrors in *driving* games that are always just in front of and above you even when you are using the third person point of view rather than sitting behind the steering wheel. I am sure you can make a whole list of unrealisms from almost every game you have ever played.

Think back to Chapter 5 and the two games Rez and Star Fox. Are there any unrealisms in those two games? You bet there are! In Star Fox, star fighters are flown by animals. You are a fox and you do not have to say exactly where you are going as your star fighter seems to do that for you. If you crash the wing of you star fighter into the side of a building you sustain a little damage, indicated by the red line at the bottom of the screen, but you don't bounce off, stall, and fall out of control to explode on the ground below. This unrealistic behavior of your star fighter when damaged is an unrealism and a good one for gameplay as well.

Rez is a game of unrealisms. Think of that gun sight you control. Where is the gun? There is no gun! How do things that explode sound like dance sounds and not big bangs? How does the character we play manage to just float along with no visible means of support or propulsion? How do we, the player, manage to float along just behind our character also with no visible means of support or propulsion? We do not usually bother to ask such questions if the game is fun to play.

Unrealisms are not just there to compensate for qualities that are difficult to represent realistically, health as a box or capsule, for example, they are also there to make the gameplay more enjoyable. If an unrealism makes for a better game then no one is going to object or even notice. In considering game content we need to pay particular attention to unrealisms. They can be a very good way of focusing players' attentions and stimulating their minds into forming connotations.

PERCEPTUAL OPPORTUNITIES

Perceptual opportunities offer a generic means of talking about both the denotative and connotative meanings of game objects. They can also be used to look at the relationship between objects' connotative meanings and the way these affect gameplay. It is not difficult to see the kinds of connotative roles objects can play. Some objects seem to attract our attention to the possibility of danger or reward. Identifying such objects offers opportunities to establish intentions to further our progress through the game. Other objects, or combinations of objects, are useful in helping us plan and achieve intentions. Intense patterns of such connotations form minimissions and retain our focus of activity in the cause of larger game objectives.

The keyword here is opportunity. Part of the art of game design is surely to provide players with carefully structured opportunities to allow them to explore, strategize, formulate and solve problems, and plan for and attain intentions, not to mention shooting, fighting, and destroying. This in turn allows them to feel some degree of control over what they are doing, allows them to creatively unfold the plot, become present, and maybe become transformed in terms of skills or their whole persona.

The PO model is a characterization of the roles objects (game content) are intended to play in establishing gameplay. Figure 7.1 shows how POs may be broken down into three principal forms, each of which focuses on different kinds of meaning that objects may offer. Sureties deliver denotative meaning and collectively try to establish basic believability. Surprises seek to deliver connotative meaning and thus collectively seek to deliver purpose. Shocks are perceptual bugs that tend to negate the other two forms by breaking the illusion of nonmediation; more later.

The relationships between POs can be documented using perceptual maps, which are various ways of organizing POs—a sort of grammar for POs—that seek to ensure that users construct an appropriate temporal ordering over their intentions and rewards within the game. In other words, through the exercise of agency they
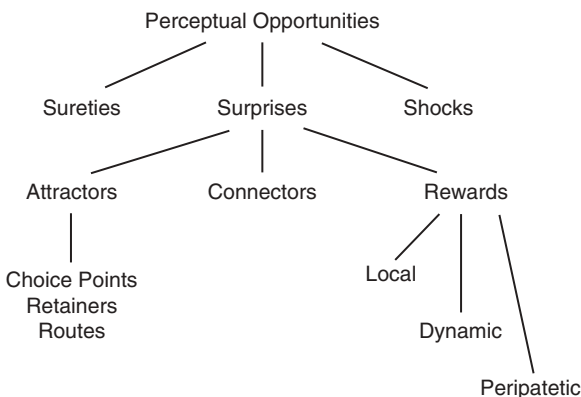
Figure 7.1   Characterizing perceptual opportunities.

develop the other aesthetic pleasures of narrative potential, co-presence, and transformation in pursuit of presence. But now let's go through all this in more detail.

SURETIES

Sureties provide certain kinds of basic perceptions that support the context in which the main gameplay exists. They are mundane details that are somehow highly predictable—their value is their predictability. They should appear to arise quite naturally and are concerned with the logic of the environment unconsciously accepted. Sureties deliver denotative meaning and thus help players to accept the fundamental nature of the world or level.

Recent research shows that much of what we know about the world we know unconsciously and that it is this knowledge that allows us to function from second to second almost independently of our conscious experience of the world (Blackmore, 1999; Damasio, 2000). For instance, most people learn how to catch a ball that someone throws toward them. Most people don't learn the calculus required to be able to consciously calculate the parabola which the ball will describe in the air as it flies toward the catcher. Even if you are one of the people who could make that calculation, by the time you had done it the ball would have long bounced off your nose and fallen to the ground. Catching a ball relies on unconscious knowledge that you can make use of but cannot explain. Much of what we know about the world we cannot explain but we use it all the time in our everyday lives. Sureties seek to supply experiences that will keep the unconscious mind happy.

Sureties should inform the game player of such things as; how big am I? How fast am I moving? What do I look like? and Have I been here before? Sureties also provide other reassuring information to do with such things as the physics of the world and the believability of other beings in terms of their avatars and behaviors. Furthermore, we are used to the real world being complex and cluttered so it helps if the virtual world of the game is as well. We call this redundant complexity perceptual noise. A useful aphorism is that in interacting with the real world we are trying to make sense of too much information whereas in games we are trying to make sense of too little.

In SinCity, such things as sidewalks, fire escapes, alleyways and doorways, and roofs and parapets all reassure us. They tell us where we are, what sort of place we are in, how big we are, how fast we are moving, how high we are, how far away things are, and so on. The neon sign on top of the half-finished building doesn't contribute to gameplay but certainly helps establish height and the believable ordinariness of the street scene. The general complexity of the buildings both finished and unfinished, the levels provided by roofs and parapets, the wire fences, ladders, doorways, and so on all contribute to perceptual noise and give our unconscious plenty to do.

Sureties succeed by not being noticed when they are there but are missed if they aren't. They are thus the basis on which the game designer seeks to achieve the willing suspension of disbelief in the mind of the player. If sureties are the basis of this then surprises are what really deliver the goods.

SURPRISES

Surprises are nonmundane details that are not always predictable but they do arise however surprisingly from the logic of the space consciously accepted. Surprises therefore are intended to deliver the memorable pleasures of the game by allowing players to accumulate conscious experience. Surprises are concerned with the connotative meaning of objects in games; they can be:

- Implausible but beneficial (unrealisms)
- Completely plausible but perhaps unexpected

and there are three basic types:

- Attractors
- Connectors
- Rewards

POs can be both sureties and surprises depending on the context in which they are offered—there is no mutual exclusivity between them. The ladders in SinCity can be both sureties, familiar objects that provide sureties for scale, and can also be surprises, giving access to rooftops. Some content items will be more or less surprising than others and may thus draw attention to themselves at the expense of others.

To put it in a nutshell, surprises will be particular features of perceivable content that lead players to form intentions, help in the process of satisfying those intentions, and finally, hopefully, provide the perceivable consequences that the player recognizes as satisfying those intentions. That's quite a big nutshell, but it does summarize the relationship between agency and POs and points toward the integrated analysis technique that was suggested at the beginning of this chapter. Let's discuss each of the main forms of surprises in more detail and use SinCity to find them in practice.

ATTRACTORS

Attractors are POs that seek to draw the attention of a player directly to areas of interest or to situations which offer agency. Attractors are the means by which players are stimulated into forming intentions for themselves. It is thus important that major attractors are associated with rewards, things to do, remember, excite, puzzle and so on and which will allow players to feel that it was worth the effort of trying to achieve the intention they formed as a response to a particular attractor.

Attractors may be characterized according to the reasons they draw attention to themselves, as:

- Mystery objects: Partially obscured/revealed objects, strange or unknown objects, e.g., both closed and open doors and doorways.
- Active objects: Movement, flashing lights, sounds changing pitch or volume.
- Alien objects: Objects that belong to another world, game, or context altogether, 2D maps, strange symbols to indicate the end of levels.

- Sensational objects: Objects that attract attention through nonvisual senses, spatialized sounds, vibrations, smells, and so on.
- Awesome objects: Large, famous, or expansive objects.
- Dynamically configured objects: Objects that are relocated in space/time.
- Complex: Objects made up of a number and possibly variety of attractors, perhaps seen at a distance.

The nature of health packs, whether floating and revolving or not, in an *FPS* are interesting because in many other genres they would be shocks that would destroy the illusion but in this genre they are alien attractors—implausible but beneficial; unrealisms in other words. They are part of the general street furniture of this type of game. So much so that they could even be considered sureties in that they would be missed if they were not there.

However, although attractors rely on a player's natural curiosity they are also directly related to the player's emotional involvement with the game. Two of the most important emotions for games are:

- Objects of desire: Objects that have some benign significance to the player and more particularly to the task at hand.
- Objects of fear: Objects that have some malign significance to the player and to the task at hand.

Some games will have a mix of both while others may have predominantly objects of fear. Any game which is all objects of desire may not particularly challenging or engaging. Very often an attractor might have several possible intentions associated with it and thus becomes a choice point, a source of great dramatic potential. However, the consequences of making choices should be at least hinted at so that a perceptive player will be able deduce the consequences of his or her choices or at least understand them after the fact. More on choice points below.

When we talk about attractors we will therefore always suggest intentions associated with them. Attractors are thus the means by which players are coaxed into following a particular course, choosing between possible courses, or changing course. An attractor might lead a player into a position where another attractor becomes perceivable and follow this to a previously undiscovered reward.

To make the concepts we are introducing clearer we are going to illustrate POs with reference to SinCity which, as we already said above, is a DM level of Sin, an *FPS*. For the sake of simplicity we will assume only one opponent in this analysis. Figure 7.2 shows some of the attractors to be found in SinCity. In the figure, gun flashes (the top highlight) aimed at you certainly focus the attention as active objects of fear—an extreme form of attractor that should stimulate an immediate response on the player's part. The associated intention "find cover immediately" would seem reasonable.

The lower two highlights are approaching bullets. Bullets and ricochets make great attractors, as objects of fear, for obvious reasons, but their alignment also points out the top highlight which is the opponent: here just a few animated pixels, but a
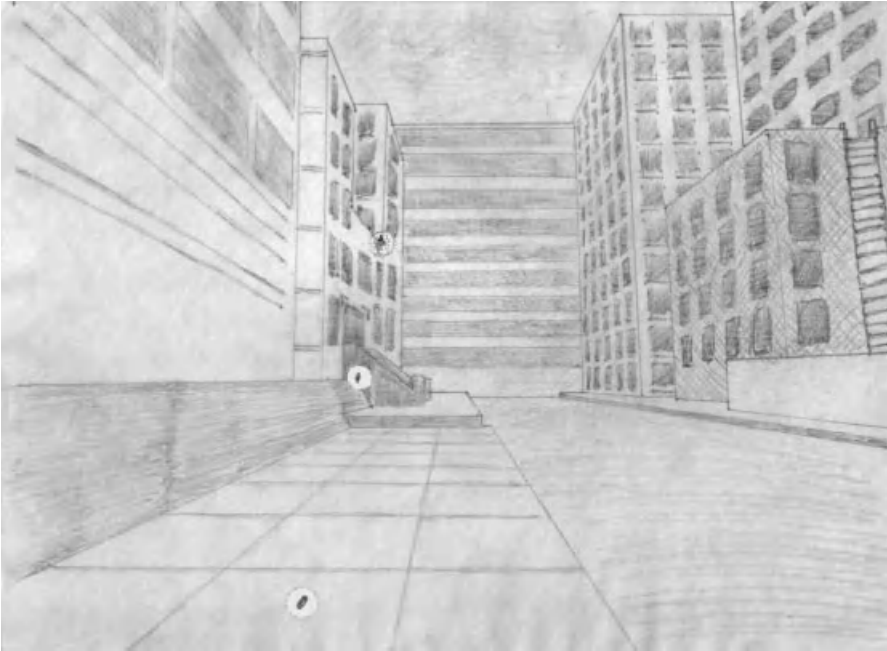
Figure 7.2 First SinCity screen shot. (See color insert.)

vital attractor all the same. The latter is an attractor because of its connotative meaning as an object of fear in this genre and would not be an attractor in all game genres. One intention here is similar to the attractor above, "find cover" but another intention could be "frag opponent." We thus have an attractor that serves as a choice point here.

Figure 7.3 shows the game at a later point. More attractors are on offer: on the left, a vantage point, highlighted yellow again, an object of desire with the associated intention to "take up an advantageous position." The two other yellow highlights are also vantage points. These are great attractors, objects of desire, in this level because you can ambush your opponent from these locations. Ammo, guns, health, and power-ups are also great attractors, objects of desire.

The center highlight is another attractor in the form of an opponent on the suspended girder. This could be both an object of desire and fear because opponents are your target and source of frags but they can also fight back.

CONNECTORS

Connectors are POs that help players by supporting planning to achieve intentions stimulated by attractors. Connectors are thus the means by which players make connections, both mental and "physical," between attractors and rewards. These help players to satisfy their intentions and deliver objectives specific to the overall
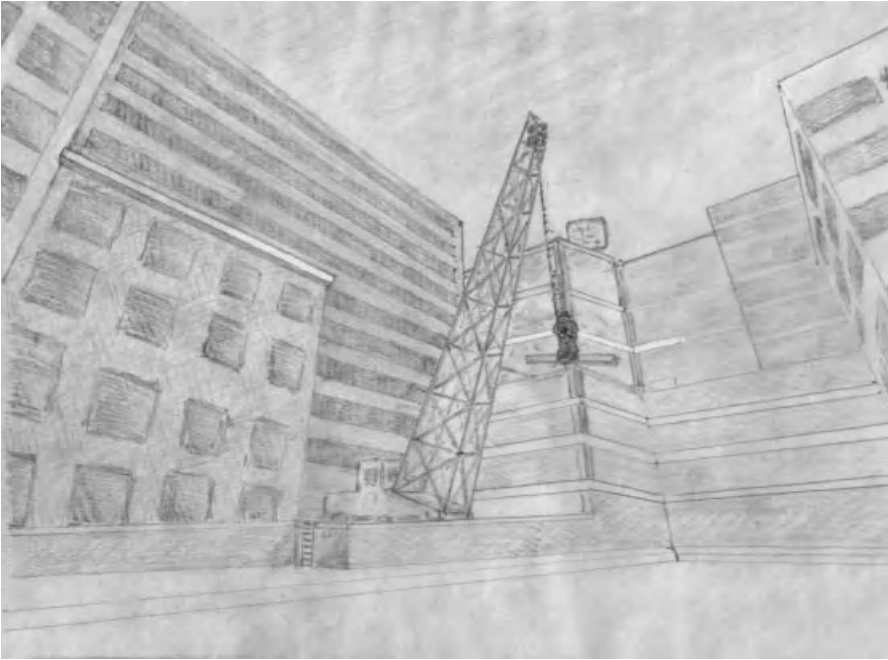
Figure 7.3   Second SinCity screen shot. (See color insert.)

purpose of the game. The actual reward associated with an attractor might well be hidden or unclear from the point of view of its attractor(s) but lower level intention formation should lead the player into situations where major objectives can be realized.

In SinCity we can identify a number of connectors. Figure 7.4 offers us a view similar to that of Figure 7.3 except here the highlights (blue) pinpoint connectors such as a ladder, a rooftop, and a suspended girder, which all make physical connectors supporting intentions such as "take up an advantageous position." Think back to the ladder on the side of the building on the left of Figure 7.2. The short ladder in Figure 7.4 connects to the long ladder in Figure 7.2, which allows the player to get to the rooftop and jump on the girder, which the crane swings around to the vantage point in the unfinished building center right, Figure 7.3, and so on: a route through the level.

In Figure 7.3 the rooftop was an attractor, but in Figure 7.4 it is a connector! And, if you think about it, it is also a surety: providing familiar details, reassurances, about a typical urban landscape. Game content often works like this. Connectors can also be information-based rather than physical. Indicators of health, weaponry, and ammo in the HUD are good examples of such connectors. Connectors can thus also help to compensate for concepts or connotations, which are difficult to express directly.
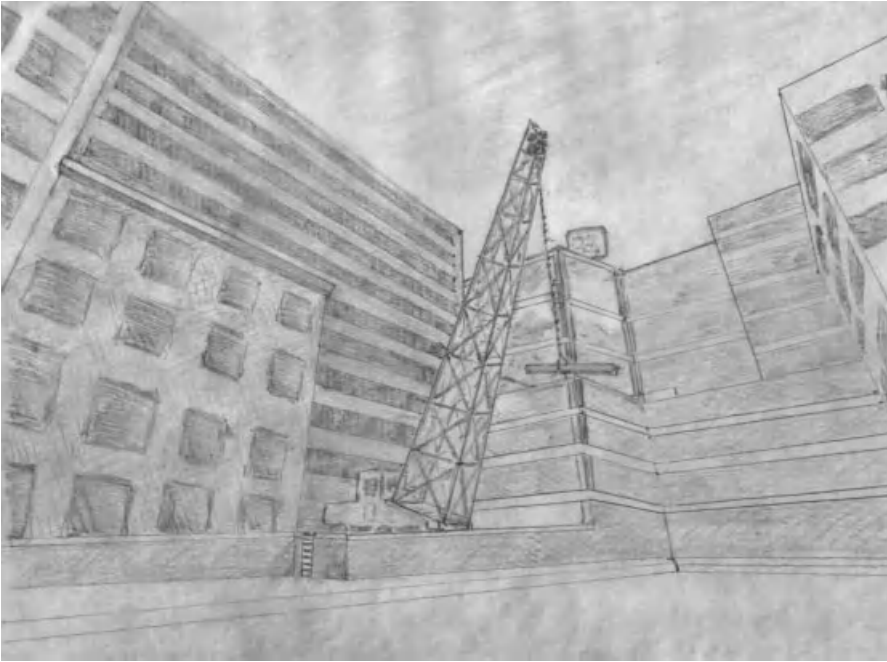
Figure 7.4   Third SinCity screen shot. (See color insert.)

Other intentions, such as collecting health or ammo, might well form part of a larger intention such as the one identified above. Here the intention might be to get to the parapet above the highlighted ladder using that ladder and another hidden from view so as to satisfy the intention "gain a position of advantage." There might also be another intention, "collect some ammo," which can be planned for and attained on the way. On the parapet there is another gun and access to the movable girder so as to get to the unfinished building furthest from view. All of these are further rewards for exercising agency.

REWARDS

Gaining rewards cumulatively delivers the objectives of a game and collectively, therefore, its purpose: to win, gain power, build up your character, and so on. A reward might be simply walking over some ammo to collect it or it might be a whole mini-mission such as a fire fight. Rewards come in three forms:

- Local: They seek to keep players in a particular place in the game.
- Dynamic: They may be encountered unexpectedly by players.
- Peripatetic: They may be offered wherever players are in the game.

As we already suggested, rewards are the connotations we place on perceivable consequences, the beneficial changes that result from exercising agency.
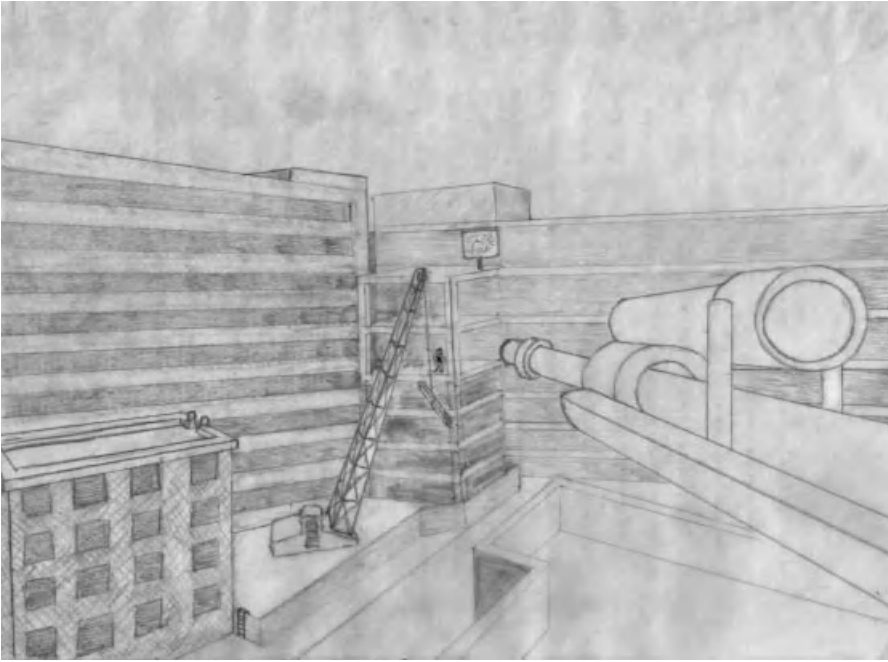
Figure 7.5   Fifth SinCity screen shot. (See color insert.)
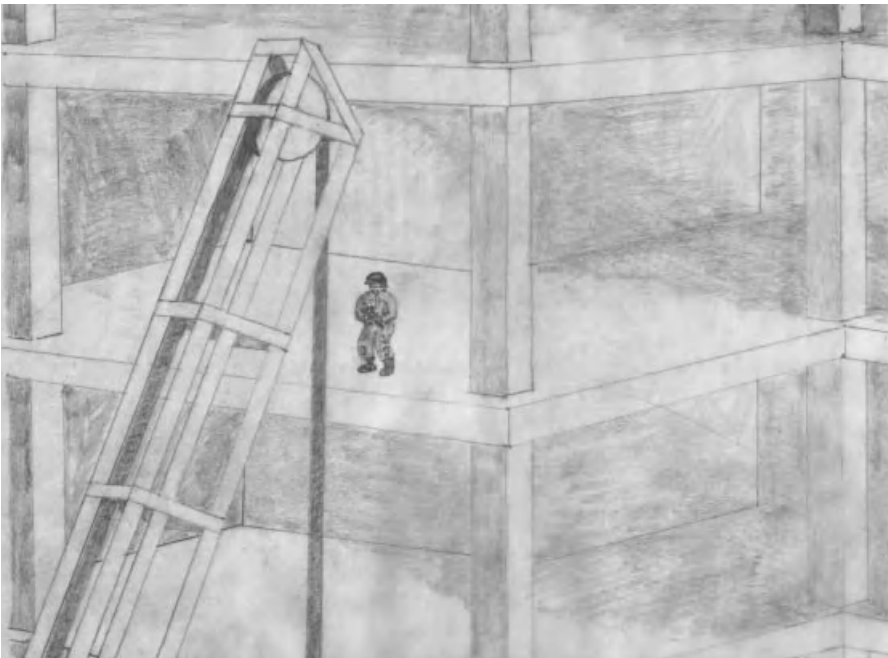
Figure 7.6   Sixth SinCity screen shot.

In Figure 7.5 we have now reached a vantage point and have a great view of many of the POs that we have been discussing: attractors, connectors, and sureties. The only highlight in this view is the opponent, the center highlight. In Figure 7.6 we are using the telescopic sight on the gun, Figure 7.5, to target our opponent: no need for highlights now. We're into a fire fight, retainer, or mini-mission; we can frag that opponent with, maybe, the element of surprise on our side. That is the reward for our tenacity. So we have now come full cycle, from attractor to intention to perceivable consequence to reward. A series of such cycles makes up the fire fight, retainer, or mini-mission. In a complete game we may go through this cycle thousands, even tens of thousands of times: that's the basis of narrative potential.

GETTING IT ALL TOGETHER IN SINCITY

In SinCity we can see attractors, connectors and rewards all functioning together to deliver the aesthetic pleasures of a death match level. Surprises should work together in patterns to form possible temporal orders or rewards and thus the coherent set of experiences that are intended to deliver the purpose of the world. Some general principles apply:

- Players should usually be rewarded if they follow attractors.
- Rewards do not have to have attractors.
- Rewards can be their own attractors.
- Rewards can have multiple attractors.

Such patterns of surprises are called perceptual maps. The aim of perceptual mapping is to take the basic instances of attractor, connector, and reward triples and compose them to build up a picture of the perceptual content of the game as a whole. We can identify a number of larger structures:

- Choice points: Present the player with a choice of competing attractors or a choice of alternative intentions for the same attractor. Murray (1997) identifies such choices as a major source of dramatic potential in VEs. They can arise from the simultaneous perception of competing attractors or as a result of multiple possible intentions suggested by a single attractor.
- Retainers: Groupings of surprises that constitute major sites of interest and/or interaction that seek to deliver the purpose of the VE as identified by requirements and conceptual modeling. Fire fights in SinCity are good examples of retainers.
- Challenge points: Can be as much conceptual as locational and are obstacles which have to be overcome in order to progress further in the VE. They are obstacles which if unresolved prevent further progress in the game. Not all games have challenge points. Classic challenge points are level bosses in games such as Rez and Star Fox.
- Routes, implicit or explicit: Draw visitors round a VE and seek to make sure that all major content is found and made use of.

Attractors should draw attention to rewards and thus to sites of retainers and choice points and so on and, if properly designed, lead visitors around the game world in a meaningful way, with the possible use of connectors. However, games will often make use of "false attractors," which are attractors that do not deliver rewards. Used appropriately, false attractors can make a major contribution to gameplay and dramatic tension. The neon sign high up on the SinCity sky line is a good example of a false attractor. It does contribute surety to the level through its familiarity in such a cityscape but it offers no reward. You can shoot at it but you cannot damage it, it does not supply any useful information, and it is not accessible on foot so we cannot use it as a vantage point. It is a false attractor. There are a number of doors that do not open in SinCity. They are good examples of false attractors. At least one of the doors does open, so that balances out false and true attractors.

Seen from a distance, an animated object may act as an attractor of desire, but when experienced close up as a reward it may be some sort of vehicle to ride in and control thus becoming a retainer—a mini-mission, in game-speak. Retainers are actually localized patterns of attractors, connectors, and rewards. Early computer games, such as Viper and Breakout, and the vast majority of contemporary puzzle games can be viewed as consisting of a single retainer in this sense.

PERCEPTUAL MAPPING IN SINCITY

We will illustrate retainers and other larger structures through an example. The simplest way of documenting a perceptual map is by way of a "Table of Surprises," which has three columns that relate attractor/connector/reward triples. Rows indicate the suggested relationships left to right and cells give brief descriptions. For SinCity, a partial Table of Surprises looks something like Table 7.1.

Of course, players might have a number of intentions at any one time and will be taking notice of a host of attractors as they execute one or more of their current plans. For simplicity we have only illustrated some of the main attractors; there are a number more. We could draw up this table in a lot more detail to consider the gameplay on a moment-by-moment basis.

We are constantly presented with choice points in SinCity. Attractors compete for our attention: ammo, health, weapons, doors and ladders. Any form of movement, ricochets, opponents seen moving—sometimes seen just as a few moving pixels—will stimulate intentions that override most others. The choice of intentions they can stimulate are themselves choice points.

As already pointed out, the major retainers in DM levels are the fire fights and ambushes that can happen anywhere in the level. Sometimes we instigate them by attacking an opponent first and sometimes we are the victims of surprise.

Challenge points do not exist in DM levels. Of course we die and fail if we loose a fire fight or get fragged, but we could avoid the fight, hide, counter attack, and so on. Challenge points typically occur in *adventure*, *point-and-click*, and *RPG* games where we can get stuck because we do not have a particular piece of information or a particular tool or cannot open a particular door. Challenge points are

Table 7.1   Table of Surprises for SinCity

Attractors	Connectors	Rewards
Ricochet (fear) Intention: find cover	Basic navigation controls, doorways, walls, alleyways, etc.	Activity: take cover (dynamic) Reward: safety, time to think, plan
Ricochet (fear) Intention: fight back	Basic navigation controls, doorways, walls, alleyways, etc.	Activity: fire and move (dynamic) Reward: frag, maybe; lose a life, maybe
Movement of opponent(s) (fear, desire) Intention: find cover	Basic navigation controls, doorways, walls, alleyways, etc.	Activity: take cover (dynamic) Reward: safety, time to think, plan
Movement of opponent(s) (fear, desire) Intention: frag opponent	Guns, ammo, cover	Activity: navigate (local) Reward: fun, increase frag count
Parapet (desire) Intention: ambush opponent	Ladders, wire fence, ledges, suspended girder, etc. NB: can collect ammo, weapons, health, etc. on the way	Activity: scale building (local) Reward: fun, increase frag count
Health indicator low (fear) Intention: increase health count NB: similarly for weapons, ammo, etc.	Basic navigation controls, road, sidewalk, ladders, rooftops, etc.	Activity: find health (local) Reward: increased health count
Illuminated sign on roof of unfinished building (awesome) Intention: destroy	Guns and ammo	Activity: take pot shots at sign (local) Reward: false attractor, sign cannot be destroyed NB: could be read as a shock
Opponent in view unaware of you (desire) Intention: frag opponent	Guns and ammo, basic navigation controls	Activity: shoot opponent (dynamic) Reward: frag opponent or miss opponent, opponent fights back, mini-mission

about getting stuck followed by the sense of release we experience when we are unstuck.

Routes are linear sequences of attractors that lead us around a level or through a city and thus draw us to places of interest: retainers. In SinCity, such things as ladders, ledges, girders, fire escapes, the crane, rooftops, and other parapets work together to form routes, which we internalize after a while. They become mental attractors in our minds. In a DM level like SinCity part of the pleasure of the game is learning the limited number of possible routes through the level and the health, ammo, and weaponry that can be picked up on the way around.

Perceptual maps have much in common with the way painters arrange the composition of a work so as to catch the viewer's attention and lead it around the canvas in a particular way. Although it is not possible to tell a story in all games in the same way as in a film or a TV program, there is nevertheless an important narrative potential in games that needs to be designed for. This refers to the purposeful accumulation of experience, which allows players to exchange stories about their ways through the game. A perceptual map is the basis upon which such narrative potentials can be designed.

Sureties and surprises in games work together much in the way jokes do:

1. My dog has no nose!
2. How does he smell?
3. Terrible!

The first two lines are unremarkable and mundane, sureties. The third line comes as a surprise but is plausible from the logic of the first two statements. All jokes seem to be much like this: you set up an imagined and consistent, however fantastical, world, and then give it a bizarre, implausible twist, which must somehow be derivable from the former. Sureties and surprises in games work together, supporting each other and thus the virtuality they inhabit by seeking to catch and retain the attention of the player and thus maintain presence and belief. If a perceptual map represents a kind of gameplay labyrinth (see Janet Murray's labyrinth [1997]) then sureties are the means by which this labyrinth is grounded, virtually, in a believable world.

The attractors for SinCity display an even balance of objects of desire and objects of fear. This indicates that reward and risk balance out. In SinCity we can redeem ourselves by acquiring new health and resources. In SinCity all guns, ammo, health, and power-ups are essentially alien because of the way they float just above ground. Health is directly connotative in that the object health represents a concept, the individual's physical well being.

If we look at the rewards we see that in SinCity they are concerned with high level objectives such as increasing the frag count but also lower level objectives such as increasing health, weapons, and ammo. SinCity is very much about rising and declining fortunes and the player's control over them.

This brings us on to patterns of intention, and their setting and planning. In SinCity it is the normal pattern of game play to have a number of intentions and their connectors, plans, and so on active at any one time. There are always the overall

objectives of ambushing opponents and keeping a lookout for opponents looking to do the same. However, players will also have lower level intentions, which they will operate concurrently, to get more ammo, weapons, and health. They will switch intentions quickly if a lower level one becomes obtainable. Attaining a lower level intention does not remove it from the current list. In such games players will keep many such intentions active so they can satisfy them pragmatically as the opportunity arises.

We can thus see that POs and their perceptual maps can tell us much about the underlying structure of games and allow us to see something of why games are as they are. We could also single out such common and useful features as alien attractors, a form of unrealism, to provide emphasis. This analysis also highlights the importance of understanding the connotative nature of even everyday objects in games: in other words, the particular contribution they make to gameplay.

AS-OCEANFLOOR

Had you forgotten you went scuba diving on this ordinary day? Remember, AS-OceanFloor is an assault level that comes with Unreal Tournament. Like Sin, Unreal Tournament is an *FPS* and comes with a variety of standard level types for single and multiplayer games. We will briefly consider AS-OceanFloor in terms of POs and see if we can spot any differences between DM and assault levels.

Being an assault level, AS-OceanFloor gives you a particular mission to accomplish. In this case you have to attack an enemy base and destroy some computer equipment. The level has three distinct zones: an entry room, a scuba dive, and the underwater base itself where the real action takes place. In general, assault levels have:

1. An entry room or starting point where you arrive and kit up,
2. The short-ish journey to where the fight takes place, and
3. The location of the fight itself.

This is a common feature of assault levels, although the zones are not usually as clearly separated as in this one. In this case we can analyze each separately, starting, logically, with the entry room. Figure 7.7 gives some indication of the view we are offered when we first arrive in AS-OceanFloor. We see the entry room with a range of objects around the walls and various other elements that might attract our attention. In Figure 7.8 we can see the view into deep water when we arrive at the area of the floor with the black and yellow markings that we could see in the floor at the far end of the room. Let's jump straight into the Table of Surprises for the entry room (Table 7.2). We will be jumping into the water soon enough.

From the Table of Surprises we can see that you are offered a range of attractors: equipment, doors, NPCs; and thus a major choice point. If you focus on the NPCs the main intention is to find out if they are friendly. Moving around we find guns, scuba gear, and ammo. Typical equipment-related attractors for an assault level. As well as all this, the doors turn out to be false attractors. It is not immediately
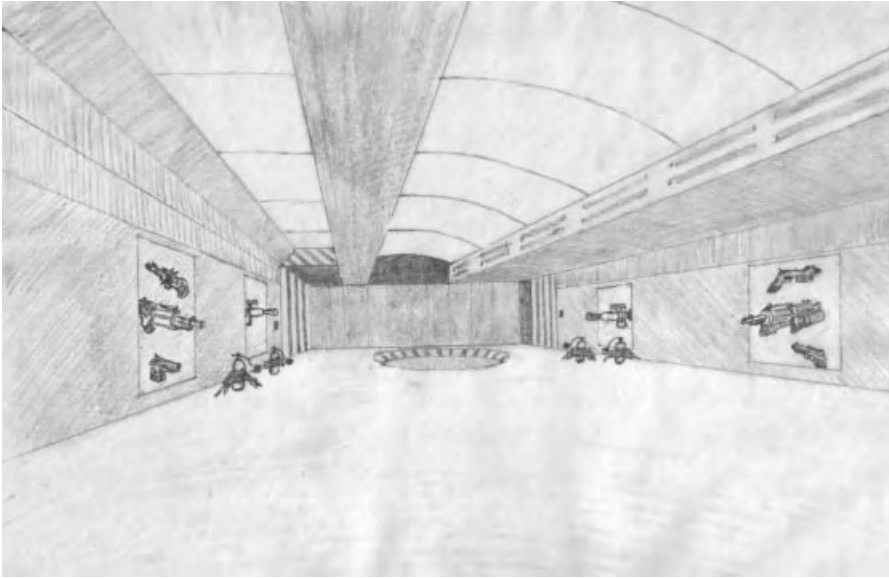
Figure 7.7   Entry room on arrival. (See color insert.)
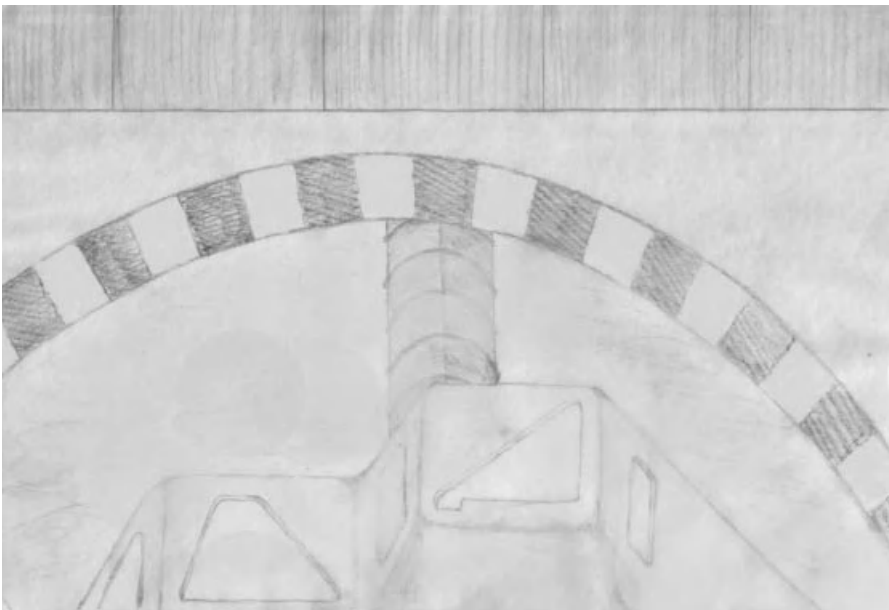
Figure 7.8   Entry room after moving forward. (See color insert.)

Table 7.2   Table of Surprises: The Entry Room

Attractors	Connectors	Rewards
NPC (mystery, desire) Intention: make sure they are friendly	Basic navigation controls	Activity: observe (peripatetic) Reward: connectors to help complete mission
Highlights on walls (mystery, desire) Intention: find anything useful	Basic navigation controls	Activity: explore (local) Reward: useful equipment
Objects on floor by walls (desire) Intention: find anything useful	Basic navigation controls	Activity: navigate (local) Reward: useful equipment
Text message: "You just picked up the scuba gear" (desire) Intention: find a use for it	none	Activity: thought (local) Reward: connector, useful equipment, clue to rest of mission
Black and yellow markings on floor (mystery, fear) Intention: find nature of warning	Basic navigation controls	Activity: explore (local) Reward: entry point into water
Exit via water, structures visible through surface distortion (mystery, fear) Intention: progress mission	Basic navigation controls, scuba gear, team members	Activity: explore (local) Reward: entry into underwater base
Illuminated wall panels in corner of room (mystery) Intention: find way out	Basic navigation controls	Activity: basic navigation (local) Reward: false attractor, decoration not doors
Doorway with illuminated handle (desire) Intention: open door, find way out	Basic navigation controls	Activity: basic navigation (local) Reward: false attractor, door does not open

obvious that it is scuba gear you have picked up but the message, "You picked up the scuba gear," makes this clear. This message, in conjunction with the doors that will not open, leads us to consider the current challenge point, how to get on with the mission. Obviously, you have to get into the water indicated by the hazard warning signs in the floor. There are no major routes or retainers at this point.

Now you are ready for part two of the mission, the short journey to where the fighting will actually take place. In this case, of course, it is a scuba dive. Once in the water we have to find our way into the base. Figure 7.8 gives a good idea of a small part of the underwater base as seen from the surface. You can see it is an angular structure with variously shaped windows with possible views inside. However, this time there is no illustration. The list of surprises in Table 7.3 should allow you to visualize this part of the level. You are quickly presented with the challenge point of how to get into the enemy base. This is a route-based zone of the game where connectors act in sequences to lead us to the sites of the two entrances to the underwater base:

- Illuminated panels in roof of underwater base
- Windows in side of base
- Seaweed and spotlights under the base
- View up into base through break in the floor.

This section and the previous one, the entry room, are more or less *adventure*-based. We do not fight but instead collect and puzzle. Eventually, you will find one of the two entrances underneath the underwater base. This brings you, of course, to the whole point of an assault level: the site of the battle itself. But again, we give only the Table of Surprises (Table 7.4). You should be able to visualize the scene that confronts you having just entered the underwater base.

We have now gotten to the assault, *FPS* part of the level, the main business. Choice points seem to be dominated by people and what they are doing, but unlike SinCity where the basic activity type is fighting. There is also has the second, but equally important, activity, which is "seek and destroy." Although we now seem to be in a straightforward *FPS*, we are not. The last attractor, "doorway," in the Table of Surprises illustrates this through the specific nature of the intention and reward associated with it. Such an attractor-reward does not appear in SinCity's Table of Surprises. AS-OceanFloor is an *FPS* with a significant adventure component in which we have to explore and solve a puzzle—where are the consoles we have to destroy?—as well as fight. These basic activity types, which come from the genre analysis, determine how we respond to attractors and indeed which attractors we respond to. This emphasizes the interrelated nature of our four theories to date. POs give us a pretty low level, moment-by-moment view of the gameplay.

Aesthetics and activity profiling give us a general picture and genre gives us an even more general one. From our analysis we see that in an assault level we are presented with an extra set of intentions not present in a DM level. The player will need to satisfy these in order to complete the mission. POs show that assault levels are more complex in terms of gameplay. And we have also seen that because the

Table 7.3   Table of Surprises: The Scuba Dive

Attractors	Connectors	Rewards
Underwater base from above after dive-in. (complex, mystery, fear) Intention: find way in.	Basic navigation controls, now in scuba mode, scuba gear, team members.	Activity: explore, swim (Local) Reward: possible entry point.
Roof with colored skylights. (complex, mystery, fear) Intention: find way in.	Basic navigation controls, now in scuba mode, scuba gear, team members	Activity: explore, swim (Local) Reward: false attractor, no useful views inside.
Roof lights, aerial, illuminated panels of different shapes. (complex, mystery, fear) Intention: find way in.	Basic navigation controls, now in scuba mode, scuba gear, team members.	Activity: explore, swim (Local) Reward: view into base from windows, view of possible entry point.
Roof lights, aerial, illuminated rectangular panel (complex, mystery, fear) Intention: find way in.	Basic navigation controls, now in scuba mode, scuba gear, team members	Activity: look in (Local) Reward: view into base from transparent roof panel, view of possible entry point in floor.
Window in side wall. (mystery, fear) Intention: get any useful information.	Basic navigation controls, now in scuba mode, scuba gear, team members	Activity: look in (Local) Reward: view into base, sight of console number 1.
Seaweed and spotlights under the base. (complex, mystery) Intention: find way in	Basic navigation controls, now in scuba mode, scuba gear, team members	Activity: explore underside of base (Local) Reward: spot possible entry point(s)
Entry point from below, blurred view into room above. (mystery, fear) Intention: get out of the water	Basic navigation controls, now in scuba mode, scuba gear, team members.	Activity: assess new situation. (local) Reward: gain access to underwater base

Table 7.4   Table of Surprises: Entering the Underwater Base

Attractors	Connectors	Rewards
Crates, health, explosions, upper floors	Basic navigation controls	Activity: assess new situation
(complex, mystery, fear)		(local)
Intention: try and make this all out		Reward: begin mission main objective
NB: initial complex attractor a major choice point		
Explosions	Basic navigation controls, packing crates	Activity: get behind the big crates
(fear)		(dynamic)
Intention: get to safety		Reward: time to plan
Health	Basic navigation controls	Activity: walk over health
(desire)		(local)
Intention: increase health		Reward: begin mission main objective
Doorway	Basic navigation controls	Activity: walk, fight through door
(mystery, desire)		(local)
Intention: is there one or more of the consoles through the door?		Reward: satisfy intention or more of the base to explore

Tables of Surprises here describe gameplay in terms of relevant game content and possible player behaviors they allow us to visualize scenes and levels in far more detail then do screen shots. In effect, Tables of Surprises are to games what story boards are to film and animation.

The switch to *action-adventure* and then back to *FPS* seems to be part of the nature of assault levels even thought they are typically to be found in *shooters*. You have to find out what the details and logistics of your mission are and then you have to actually accomplish it. As you play the level you build up a mental map of what you have to do, as well as where and how. After a while *action-adventure* gives way to *FPS* because you know what you have to do and where to go to do it.

SUMMARY

POs are a means of analyzing games in terms of the underlying dynamics of game-play and they can be used to do this at varying levels of granularity. By this, we mean that we can take a very high level view of a game in terms of major retainers and their attractors or we can study a game, more likely a small portion, in far greater detail. In the latter case we would look at the moment-by-moment attractors and rewards that over time build up into recognizable activities. Perceptual mapping allows us to look for patterns of attractors which seem to fall into a remarkably small

set of possible types: choice points, challenges, retainers, and routes. POs and the perceptual maps built upon them are generic to all computer games and a wide range of other interactive digital environments. This allows us to compare apparently unrelated games in terms of the generic structures that POs bring to view.

POs do not give us the whole picture, but in conjunction with genre, activity profiling, and aesthetic analyzes, they do give us a coherent range of insights when it comes to analyzing games. Just how complete will be the topic of Chapters 11 and 12, but we can make a few observations here. The pace of gameplay is very important to games. For some it is fast and twitchy while for others it is more measured and thoughtful. POs do not allow us to model this but twitch factors give us a good starting point.

POs also do not tell us everything about the nature of the virtual space in which the player has to function. They don't tell us about the look and feel of the game environment and the way this affects players. POs deal specifically with connotations relating to agency and gameplay. This, in fact, is also the case with the genre, activity, and aesthetic theories we have been working with and the point was first made in Chapter 5 when we were discussing Rez and the work of the painter Kandinsky. Chapter 9 will discuss these issues in more detail, and Chapter 10 will deal with the solution.

More emphasis could be placed on skills and the skill levels needed to form intentions and attempt to attain them. POs don't offer insights into the complexities of the physical interface, the mapping between mouse and keyboard controls and the perceptual interface of the perceived weapons and their usage, for instance. However, it should be clear that a number of these issues are be covered by the other theories we have already studied. Again, those that are not will be dealt with in the final three chapters of this book.

However, in the next chapter we will carry on with our use of POs to analyze games. One thing we should have learned from this chapter is that in many respects the heart of gameplay, regardless of genre, is a very simple repeated pattern of attractors giving rise to a choice of intention giving rise to actions giving rise to perceivable consequences giving rise to rewards, and so on.

FURTHER READING AND TASKS

POs were developed to help teach VR design in the first place and then led on to a whole body of research, which in due course was applied to computer games. The main reference to POs is Fencott (2003). A comparison of three games and two virtual reality applications using POs can be found in Fencott (2001). The role of POs in the context of designing computer games and interactive digital environments in general can be found in Isdale et al. (2002) and Fencott (1999).

It's time now to see how your understanding of POs is developing. Go back to Pac-Man and Spacewar and use POs to analyze their gameplay in more detail. Then, because both games are from the pregenre era, try attributing genres to them based on both the PO and aesthetic analyses you will have for both of them.

Chapter 8

Big Bad Streets

Remember that ordinary day we were talking about? It's not finished yet. We need to talk about your driving habits; at least, we need to talk about your driving habits in Driver.[1] We will consider Driver in terms of POs and then we can compare it to SinCity to see if we can learn anything in general about games.

Relating attractors to intentions and both of these to perceivable consequences and rewards is at the heart of gameplay and a good game should make this process so natural to the player that maybe the player never realizes how narrowly focused and cleverly designed the agency is. If Driver is a good game—and Clive is not alone in the world in thinking this—then how does it establish the intention-forming process in the mind of the player? Not unusually, Driver uses an introductory series of cut scenes to establish a back story that introduces the game; tells us who we, the player, are; suggests the kinds of situations we are likely to find ourselves in; and tells us what our allegiances are.

So, let's start by considering Driver's back story to see how it attempts to make clear to us the game's particular genre characteristics. We will then go on to analyze Driver in terms of POs and see how the game directs our choices of attractors and formulation of intentions. From this we can build up an abstract model, based on POs, of Driver's gameplay. We can then compare this to the model for SinCity and see where that gets us.

DRIVER SCHOOL

It's pretty clear that Driver is a *driver*. But it should be pretty clear by now that *driving* is a metagenre that can be customized to a whole range of subgenres. Remember, Ernest Adams and Andrew Rollings use the metagenre *VS* (*vehicle simulation*), which can include spaceships and fighter planes and railway trains and anything else you could imaginably drive, pilot, sail, or ride. Remember, we call our version of this metagenre *driving/piloting/crewing* (*DPC*). So, we know that there are racing *drivers*, simulation *drivers*, war and fighting *DPCs*, and many more.

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[1] Published by Reflections.

Driver is one of those "many more." In effect it belongs to a subgenre of *DPCs* in which we have to race against the clock to get our vehicle across difficult terrains in the face of various dangers, whether natural or sentient. Rally games fall into this subgenre. In the case of Driver the dangers are police cars, traffic, and street layouts rather than difficult off-road terrains. The back-story for Driver establishes this quite clearly.

The opening cut scenes establish not only that the player is a policeman but also one who has some sort of experience as a racing driver. Of course, we are now asked by our boss to go undercover and drive cars for criminal gangs robbing banks and doing just about anything else criminal that needs fast cars and driving on the edge. We are going to be a racing driver who, as a policeman undercover, is allowed to break the driving laws in order to find out what we can about the criminal gangs we work for. The role of transformation in this game is not difficult to determine.

One of the interesting things about this back story is that it is simply there to affect the way we prioritize attractors and formulate intentions. Never during the game are we actually asked to supply information to our police masters. This is not part of the game. It is just a justification for enjoying breaking the law. Perhaps simply playing a driver for a criminal gang didn't sit too well with the game's publishers, who feared a moral backlash from indignant parents. We don't know. The fact of the matter is that the back-story sets the scene and gives us clear guidance on high level gameplay but the rationale for the back story, a policeman working undercover, does not figure in the narrative potential we are to be offered.

Back-stories are often like that; take *Star Trek: Voyager*, for instance. We know from the back-story that Voyager has accidentally been transported millions of light years across the galaxy and it will take the crew some eighty years to get home. This is just a narrative context, as most of the episodic stories make (if any) only a passing reference to this. The back story establishes a context in which all sorts of unknown species and physical phenomena can be encountered and, as importantly, all the species and histories of the species in other Star Trek series can be discarded. That is what Driver's back story does for us, the player.

We are not finished yet with Driver's back story and its scene-setting, intention-forming exercise. Having absorbed the opening cut scenes we are required to prove our driving skills to someone who organizes "jobs." To do this we have to complete an opening level which requires us to perform a series of highs speed maneuvers, handbrake turns, and so on, in the confines of an underground car park. This level is cleverly done because it not only acts as a training level for the controls but also reinforces the back-story and in particular its effects on agency.

The person we meet is a cool, black dude—we guess this solely from his voice, for we never see him—who is only too happy to make very pointed remarks about our driving skills and in particular the lack of them. We not only learn to use the simple yet deep controls (Csikszentmihalyi, 1990)—you only need six fingers—and the range of maneuvers they can enable but, most importantly, we have met our first criminal. We have become part of the criminal underworld. The guy testing us is not concerned about damage to other people's cars; he's only concerned about his own car, the one we are driving— "Mind the paintwork!"—and our usefulness to

him. You do not lose points by damaging other cars but you do fail if your car gets too damaged to continue. You can be as reckless as you like as long as you complete the mission. Our intentions should now be clear.

SURETIES

Now on to our experiences of Driver, the experiences Driver offers us. First of all, we will make a few brief notes on sureties. Street furniture, building fronts, parking meters, trees, pedestrians, and much, much more all give realistic sensations of speed. Buildings at a distance and people and vehicles at various relative distances give scale sureties. Distance is a little more problematic. We only see a few blocks into the distance because the city at any one moment only exists for a few hundred meters around us; buildings appear out of the "mist" as we speed toward them. This is obviously to allow the game engine to run more efficiently and achieve an acceptable frame rate. Although there are recurrent shocks in Driver, this is not one of them. The magical appearance of buildings—we never see them disappear—seems to focus our attentions on the near and middle ground, the particular task at hand. There is a lot of detail in the city: buildings, moving cars and people, gas stations, underground car parks, and so on, all of which generate good levels of perceptual noise.

There is also good self-image. Clive, for instance, always chooses the third person point of view so he can see the car he is driving and see that it behaves very realistically, with wheels that turn to steer, suspension, collision damage, and so on. Car horns sounding at him and cars stopping and trying to get out of his way gives a good sense of other people around in addition to the pedestrians. Sureties for the past are provided by crashed vehicles, skid marks in grass verges, and the remaining damage to your car and the police car. In terms of physics sureties you can crash through tables, chairs, and parking meters but not streetlight poles or trees. It is very easy to leave the ground going over humps and bumps but this is fun, so it still provides good sureties. The car appears to behave very realistically in terms of maintaining and losing grip on the road. All in all we see a rich set of sureties. There is plenty to keep the unconscious mind occupied.

Before taking a look at surprises we might just mention shocks, as there are some in Driver. Crashes often result in not only damage to cars, but also loss of polygons, resulting in "see-through" body panels and so on. Cars also often seem to defy the laws of physics when they hit bridges or hills. Flying police cars are a fairly common sight in Driver and are also very funny, which would seem to suggest a level of exaggeration at least bordering on shock; such flying cops do not constitute a shock, however, because of their contribution to the game's aesthetics. We need to add humor to our list of aesthetic concepts that need to be accounted for.

A true shock occurs in Driver when you have completed a mission or a section of a mission and people run from a bank, for instance, and get into the car you are driving, or they run from your car to the door of a building. Doors are never opened in these situations. Instead the people seem to fade through to where they are going

in a most unnatural way. This is an amusing shock that is not severe but nonetheless reminds us of the mediated nature of this game world.

On the whole, Driver is shock-free. There are other content items that could be considered shock-inducing—such as the tens of identical Chinese restaurants in Chinatown in Los Angeles—but because they are intended to contribute to overall surety and not the intense gameplay they barely register unless, like us, you are scrutinizing the game intensely.

SURPRISES

We now move on to surprises: what we actually do in Driver and how we can use POs to model an abstraction of this in order to gain insights into the fundamental nature of the game and its gameplay in particular. First of all we will describe a typical mission and some subjective thoughts about it. We will then represent these more directly as a Table of Surprises.

We're in Miami staying in a small, seedy motel in the south of the city. We get a call to go and collect some Kalashnikovs that have been smuggled into the port. As we pull out of the motel's little car park into the city we check the on-board dynamic map that shows a few blocks of the city street plan immediately around our current position. We do not know where the port is but there is a gray triangle whose furthest point indicates its direction. We cannot see that far yet; we only see the general direction we have to go in. We drive off across the city not bothering too much about the laws of the road but trying to avoid damage to our car. It is also a good idea to stick to the rules when we see police cars out on patrol. If we break the law that will register as a felony, the police will chase us, and that will make the mission difficult and maybe impossible.

Eventually we get to a narrow and very busy road that leads out to the port. We overtake when we shouldn't, drive on the wrong side of the road, and generally annoy other road users. We look out for police patrols all the time. Getting into a chase here would be very difficult to get out of successfully. With a little luck and hopefully not too much damage, we get to the right place in the port and stop under a giant red arrow, floating in the air and pointing downwards. We stop under it and in response a message is overwritten on the screen, "Get the rifles back to the motel!"

We turn and race back to the narrow road that we have to renegotiate. Police messages sound in our ears, "suspect heading north, suspect heading west." They're on to us but we'll have to tough it out. If we can make them crash in the port area they won't be able to chase us down that narrow road. With skill and a little luck, that is what happens and we make it off the narrow causeway road and back into the city proper. Now we have to get across town back to the motel. It is not so crowded here and we have a choice of routes, but as we get close to the motel, "suspect heading south," sounds in our ears. We've got a tail. As we get close to the motel we see a large, red exclamation mark floating in the air above the entrance to the motel car park. We have to drive around the block and lose the police chasing us. If we can make a couple of turns quick enough they might lose sight of us; and

we will hear, "we've lost him," on the police radio. Then we will be able to get back to the motel and complete the mission. Driving on the edge is the name of the game.

This is a typical Driver mission but there are others. Sometimes you have to follow people in other cars or traveling in the overhead mass transit system. Sometimes you have to find shops around the city and destroy them by driving into them. The police are a constant nuisance and the streets are busy and awkward.

Table 8.1 is a Table of Surprises that captures the main patterns of attractors and rewards that you might encounter in a typical Driver mission. Notice that we have now split rewards into perceivable consequence (PC) and reward (R),

Table 8.1   Table of Surprises for Driver

Attractors	Connectors	Rewards
A1 Pointer on dynamic 2D map (desire, mystery) Intention: find out where in the city its pointing to NB. Sets up the top level intention for the mission	Roads and junctions on the map plus road, junctions, and traffic ahead of you on the street Activity: driving, avoiding, route finding	(local) PC: driving in direction of goal R: starting to achieve mission
A2 Junction (active, complex mystery, fear) Intention: cross junction, avoid damage to car	Basic navigation controls, dynamic 2D map Activity: careful driving through heavy traffic	(dynamic) PC1: crash R1: mini-mission, try to extricate yourself from crash situation with as little damage as possible PC2: clear junction R2: move closer to objective
A3 Junction (active, complex mystery, fear) Intention: make left/right turn, avoid damage to car	Basic navigation controls, dynamic 2D map Activity: careful driving through heavy traffic	(dynamic) PC1: crash R1: mini-mission, try to extricate yourself from crash situation with as little damage as possible PC2: turn and clear junction R2: move closer to resolving main intention
A4 Police radio message: "suspect heading…" (sensational, fear) Intention: avoid confrontation with police NB: this attractor also serves to heighten tension	Rear view mirror, road ahead, dynamic 2D map Activity: check all connectors for whereabouts of police	PC: detect number and positions of police, R: the pleasure of the unpredictable, mini-mission to lose police

(*Continued*)

Table 8.1 Continued

Attractors	Connectors	Rewards
A5 Police radio message: "we've lost him" (sensational, desire) Intention: return to the mission	Rear view mirror, road ahead, dynamic 2D map Activity: normal driving	PC: no police detectable R: successful completion of mini-mission, move closer to resolving main intention
A6 Police in rearview mirror (active, fear) Intention: get rid of police tail	Traffic, street lights and trees, side turns Activity: swerving to get police to crash into vehicles or street furniture behind you, speeding and taking side turns to get away from a collision situation	(dynamic) PC1: police crash or lose you R1: continue with mission PC2: rammed by police R2: mini-mission, escape crash situation
A7 Police patrol visible and felony at zero (fear) Intention: avoid being noticed	Basic navigation controls Activity: drive within the law	(dynamic) PC1: go unnoticed R1: continue with mission PC2: traffic violation noticed, police radio message R2: mini-mission, police give chase
A8 Police roadblock ahead (awesome, fear) Intention: get through road block, avoid damage	Basic navigation controls Activity: find largest gap in the road block	(dynamic) PC1: clear roadblock R1: continue with mission PC2: crash R2: mini-mission, how to get out/get through
A9 Police roadblock ahead (local, fear) Intention: avoid road block, avoid damage	Basic navigation controls Activity: 180 degree handbrake turn	(dynamic) PC: facing in opposite direction R: find another route to achieve mission
A10 Police roadblock ahead and police in rearview mirror (local, fear) Intention: get through road block, avoid damage	Basic navigation controls Activity: find largest gap in the road block	(dynamic) PC1: clear roadblock R1: continue with mission PC2: crash, rammed by police R2: fail mission
A11 Damage indicator high (fear) Intention: sustain no more damage	Basic navigation controls Activity: careful driving	(dynamic) PC: police catch you up R: more difficult to finish mission

Table 8.1 Continued

Attractors	Connectors	Rewards
A12 Clock running down (fear) Intention: try to finish level faster	Basic navigation controls Activity: take more risks	(dynamic) PC1: make faster progress R1: perhaps succeed in level PC2: crash R2: restart level
A13 Large floating red arrow, static (alien, desire) Intention: complete level NB: this attractor can also mark the end of a section of a mission	Basic navigation controls Activity: park under arrow	(static) PC: "well done" message R: completion of mission or subsection of mission
A14 Large floating red arrow, moving (alien, active, mystery) Intention: follow what is being pointed at	Basic navigation controls Activity: driving and looking at moving red arrow	(dynamic) PC1: keep subject in view R1: closer to completing mission PC2: lose subject R2: fail mission
A15 Large floating, static red full stop, "you're too early" (alien, fear) Intention: use up more time	Basic navigation controls Activity: drive around some more	(static) PC: the time counter tick down R: you can still finish, you know where to go
A16 Large, static floating red exclamation mark, "lose police tail" (Alien, fear) Intention: lose police tail	Basic navigation controls, street layout, other traffic Activity: outrun police car or make it crash Uses *traffic, street lights and trees, side turns*	(dynamic) PC1: lose police tail R1: can now complete mission PC2: rammed by police R2: mini-mission, escape police attack
A17 Pedestrians (desire) Intention: run them over	Basic navigation controls Activity: drive toward them	(dynamic) PC: miss R: a false attractor, always failure, they always get out of the way, killing pedestrians is not part of the game
A18 Cafe furniture, park benches, cones, parking meters, garden fences, etc. (desire) Intention: drive through it		PC: variously flattened and/ or knocked out of the way (local) R: destruction, amusement (doesn't further the mission)

sometimes two for each attractor. In fact, it captures just about every important situation you are likely to encounter.

Let's now look at the larger perceptual structures we can identify from the Table of Surprises. First of all, choice points; there are major choice points that arise at junctions which are complex attractors offering us the possibility to continue our current direction of travel or change it. There is far more to junctions than this as entries A2 and A3 make clear. Changing direction is a matter of intention but the complexities of moving traffic complicate the matter, and we have a number of choices as how to negotiate traffic crossing or about crossing the junction in a number of directions. Junctions therefore present choice points of two distinct types: a choice between intentions and a choice as to how to achieve the chosen intention. Choice points also arise when moving through traffic between junctions. We are constantly asked to choose between which side to pass traffic on, which side of the road to drive on, to drive on the road or sidewalk, and so on.

Another major choice point arises with A8 and A9 when we encounter a police road block and we are not already being tailed. In this situation we have the choice of finding a way through the road block—there is usually a way—or making a 180° handbrake turn and finding another way to achieve the main intention of the level. Notice that A10, where the road block is visible but we are also being tailed, invalidates the choice point as in the act of making the handbrake turn we will most likely be rammed and thus embroiled in a whole mini-mission we could have avoided.

Routes in Driver are comprised of a series of major junctions and landmarks; open spaces, for instance. We construct routes as we learn how to get to the destination that will mark the completion of the mission or a section of the mission. Routes might not necessarily be the shortest route between the start and finish points but might be chosen because they avoid difficult places to drive or known concentrations of police.

Challenge points in Driver usually relate to sections of the city that are difficult to negotiate because they are narrow and crowded. They are particularly challenging when a turn, for instance, is required and police are present. The narrow causeway road to the port in Miami is a good example. A15 also introduces a different form of challenge point, as we have no alternative but to lose the police tail. A4 and A6 might also be considered in the same light.

There are a number of generic retainers (mini-missions) in Driver but mostly these are dynamic in that they can occur anywhere in the city. The first involves being noticed as a felon by a patrolling police car which then gives chase; the challenge point discussed in the previous paragraph which, in turn, gives rise to a retainer to resolve it. This leads first of all to a chase retainer in which we, the felon, attempt to lose the police car by either swerving in and out of traffic and other solid obstructions in order to make it crash or by making a series of turns at junctions and losing it in that way. This retainer also often occurs at the end of a level if we approach the alien attractor with police already on our tail. A minor form of this also occurs when we arrive at the end of mission sign too early and have to drive around to waste time.

If we do not lose the police car we will almost certainly end up being rammed and forced into a crash retainer where we must try to find a way out with as little

damage as possible. "Threading" a police road block is another generic retainer. There is usually a way through if you drive very accurately. Similar, though not nearly so catastrophic, retainers might occur when we inadvertently crash into non-police traffic on the road. This might result in some serious efforts to "get back on track." We sustain damage, waste time and may well attract the attention of the police.

Chase missions—usually involving A13—may be considered to be retainers in themselves, much in the way we observed many early games to be in the previous chapter. In a chase mission we have to follow a vehicle, identified by a dynamic red arrow, the end-of-mission marker, to some point where it stops or where we can ram and destroy it.

Other things to look for include the range of intentions a player holds at any one time. How many sources of information is the player offered for monitoring at any one time? Where and how is such information presented? For instance, are they abstractly represented in the HUD or are they directly presented in the main game display? How does all this affect the nature of the gameplay? We will answer these questions in the next section by way of a comparison with SinCity, which we analyzed in the previous chapter.

DRIVER AND SINCITY COMPARISONS

If we compare the Tables of Surprises for SinCity with that for Driver we see that, despite their differing genres and the fact that we are comparing a DM level with a complete single-player game, POs and POs organized into tables of surprises do capture the essence of the gameplays of the two games. This is because we are dealing here with the underlying dynamics of gameplay. We can see now that the two original situations described in the opening paragraphs of the previous chapter were actually examples of attractor/connector/reward triples. Despite their superficial differences, the POs do identify them as having certain similar structures. Furthermore, comparison of the two tables highlights a number of interesting things. The actual sizes of the tables are not significant as we can never be sure we have all possible entries nor can we be sure we are identifying attractors at exactly the same level of granularity. Remember, complex attractors are composed of any number of attractors including other complex attractors. Size does not help us.

The attractors for SinCity display an even balance of objects of desire and objects of fear. This indicates that reward and risk can balance out. In Driver the attractors are almost exclusively objects of fear with a few being objects of both desire and fear. There are five objects of desire in Driver:

- A1: main intention
- A5: losing a police tail
- A13: end of mission
- A17: pedestrians, a false attractor

- A18: street furniture, cafe furniture, motorway cones, road work signs, etc.: pointless destruction

Only the first three of these make any contribution to eventual success. Altogether this indicates that there is an unremitting level of risk in Driver.

Both games use alien attractors, though in different ways. In SinCity all guns, ammo, health, and power-ups are essentially alien because of the way they float just above ground. Health is directly connotative in that the object "health" represents a concept, the individual's physical well being. In Driver the three end-of-level markers are all alien, but appropriately so. This is because it would be difficult to find a specific building or location at the best of times but when trying to complete a level in a damaged car pursued by psychotic police cars it would be nearly impossible. Also the added tension of almost but not quite having completed a level, A15, adds to the excitement of the game.

If we look at rewards, we see that the rewards in SinCity are concerned with both high level objectives such as increasing the frag count but also lower level objectives such as increasing health, weapons, and ammo. The rewards in Driver are all focused on the overall objective of reaching the specified location to complete the level. There are no rewards that decrease damage or give the player extra time. From this, and the observations on attractors above, we can see that Driver is a game of attrition and requires more or less a complete focus on the main objective. SinCity is very much about rising and declining fortunes and the player's control over them.

This brings us to the patterns of intention setting and planning in the two games. In SinCity it is the normal pattern of gameplay to have a number of intentions and their connectors, plans, and so forth active at any one time. There are always the overall objectives of ambushing opponents and keeping a lookout for opponents looking to do the same. However, players will also have lower level intentions, which they will operate concurrently, to get more ammo, weapons, and health. They will switch intentions quickly if a lower level one becomes obtainable. Attaining a lower level intention does not remove it from the current list. In such games players will keep many such intentions active so they can satisfy them pragmatically as the opportunity arises.

In Driver the high level intention, the level's mission, runs concurrently with the lower level intention which supports it and is to do with the current situation on the street. When the latter is satisfied, a new lower level intention is identified to do with the next street situation on the way to the main intention. This pattern is only interrupted by the arrival of police on the scene, A4, at which point other short term intentions to do with immediate survival come into play and temporarily replace both the high level intention and its current lower level supporter. However, although the patterns of intention setting and holding may be simpler for Driver than SinCity, the manner in which we arrive at those intentions is not at all simple.

If we look at the Table of Surprises for Driver we can see a lot of sources of information via an array of connectors that support the main view into the current cityscape. Driver is not as straightforward a first/third person game as it might seem; in fact, we have the following competing for our direct attention:

- The viewing frustum: The 3D view into the current cityscape.
- The rear view mirror: Another 3D view into what is currently behind us, not just an aid to safe driving but a vital tool when engaged in a retainer to lose police tails.
- The 2D dynamic map: This not only shows us where we are and the general direction of the location we have to find, it also shows us where police cars are in the vicinity, but not necessarily visible in either of the two 3D views above.
- The police radio messages we are listening in to: These tell us if we have been spotted and if we have lost a tail.

There are also some more traditional connectors:

- Damage: Indicates how much damage our car has sustained and thus how close we are to failure.
- Felony: How wanted we are by the police, this in turn affects the amount of attention the police pay us.
- Time: Which might be time taken or time left.

We need to be aware of and make use of all seven to be successful in a Driver mission. The Driver worldview is multifaceted, multimodal, and changes in real time. By contrast a typical *FPS* such as SinCity uses a single coherent worldview, the viewing frustum supported by traditional connectors giving indications for health, guns, and ammo. We suspect this is one of the reasons for Driver's original success. The game, the intentions we must form and resolve, is not simply "in the screen." It is distributed in various forms in both sound and vision in the game space. The player has to work hard to form a coherent mental model of what is actually going on. This has other implications for the game.

As in a typical *stealth* game, there are various ways to complete a mission. We can simply take the shortest route and attempt to outrun the police or we can plan a route to avoid the current positions of the police and give ourselves less hassle; we can go for "all twitch" or we can go for "twitch and stealth." On the whole you can't escape the twitch factor entirely in Driver. This is due mostly to the ever present and ever vigilant police who never seem to miss a suspect. The police cars—or rather their behavior—constitute a major unrealism even by U.S. standards. The city appears "real" but the psychotic police cars, always willing to sacrifice themselves to ram suspects and anyone else that gets in the way, are not at all realistic. In terms of behavior the police cars do not so much follow the suspect as match the car's movements moment by moment; it is thus quite possible to make them crash into other traffic by swerving in and out and thus lose them. All in all, the police cars are the very connotation of menace. The game is thus an intriguing contradiction between the visually real and the behaviorally unreal. No accident, we suspect (pun intended).

We can thus see that POs and their perceptual maps can tell us much about the underlying structure of games and allow us to see something of why games are as

they are. For instance, we should point out the power of alien attractors to emphasize particular features: a common and useful design feature. This analysis also highlights the importance of understanding the connotative nature of even everyday objects in games.

SUMMARY

Comparative content analysis is an excellent means of coming to understand games in a more fundamental way. The underlying structure of games—as revealed by POs and perceptual mapping—reinforces the insight we derived from the investigations of Part I; but the examination of games in terms of genre, activity, and aesthetics can, if we are not careful, mask the complexity and variety inherent in games that may at first appear similar.

In this chapter we have concentrated on the way POs reveal gameplay structure. Perceptual mapping, Tables of Surprises in this case, make clear however just how interconnected are POs and aesthetics, particularly agency. We have not gone on to discuss the relationship between other aspects of aesthetics, such as narrative potential and transformation, although it should be clear from our discussions of Driver that they definitely arise out of the exercise of the agency on offer. The mission-based nature of the game, the fact that the missions all have names, and the breakdown of many of these missions into a series of subgoals, emphasizes narrative potential. The patterns of choice points, routes, challenge points, and retainers (mini-missions) adds a further level of support by allowing us to complete our own version of the narrative; we realize the level's narrative potential through our exercise of agency. We already alluded to transformation earlier in this chapter. For our part, we find the possibility of playing a criminal driving, in whatever way we have, to be a major transformative pleasure; particularly as we can walk away from it when we wish. In many ways we have already discussed co-presence. It is a major aesthetic pleasure of the game; Driver would not work without it. But consider for a moment the way "others" are manifest in this world. The only people you actually see are the pedestrians and you do not effectively interact with them; you can make them jump out of the way, but that is all. The people you can interact with are all inside cars and you never see them. Would you be quite so happy to ram other cars and cause major crashes if you could see frightened and injured people and the associated blood and severed limbs? This was the case with Grand Theft Auto, but with Driver we are very much in the world and not dislocated observers looking down from above.

Many of the important connotations we derive from the game's content and which provide a vital context for its success have not actually been analyzed in this chapter, although their importance has been noted. We are thinking particularly about the way the criminal underworld is connoted. The relationships between such connotation and the intentions we form and prioritize have been discussed in some detail but the way in which we arrive at such connotations has not. What we are actually doing here is confronting the interface between the world of computer games and the real world; the way in which we understand and make meanings in general. We

bring our knowledge of the criminal world, however secondhand that may be for most of us, to bear when we interpret undercover investigation, seedy hotel rooms, mysterious messages on answering machines, and so on, as a license to break the law. To what extent do we need to bother ourselves about this process? The question will arise again in the next chapter.

FURTHER READING AND TASKS

Further reading for POs was discussed in the previous chapter but the main reference is Fencott (2003). Comparative content analysis has been shown to be a very powerful way of utilizing POs—and the other analyses we have used in this book—to gain insights into the fundamental nature of computer games. A good example, which consists of a comparison of three games and two virtual reality applications, can be found in Fencott (2001). POs have developed over the years and the content of Tables of Surprises in particular has changed somewhat but this should not affect the usefulness of earlier versions.

We have an interesting challenge for you. It's more of a case study really. For this and the following three chapters we want you to conduct a thorough analysis of a *sim* game called OpenCity. It's free and open source so anyone can download it and play it. You can find it at http://www.opencity.info/en/Index.html. It's similar to the very earliest versions of SimCity. It's complex enough to test your understanding of POs, but because it's decidedly non-twitchy you will have plenty of time while playing to think about game content and gameplay and so on.

So, we suggest you download and play this version of the game for a while and then get on with just your PO analysis: construct a Table of Surprises, look for choice points, retainers, and challenge points, and so on. In Chapter 9 we'll get you to add in your own analyses using the theories from Part I, while Chapters 10 and 11 will get you to fill out your analyses even more; but how you will do that will remain a mystery for a few more pages.

One reason for choosing OpenCity as a case study is that the gameplay is so different from that of all the games we have studied so far. It is also quite a complex game: there is a lot of information to process and the relationship between the perceivable content of the game is not nearly so obvious as Driver or SinCity; there's a hint for you.

Chapter 9

Time to Visit Yokosuka

Time now to travel to Yokosuka, in Japan, and visit someone Clive got to know quite well. His name is Ryo Hazuki; he is sixteen and has been having a rough time lately. Recently some people broke into his father's dojo, where he taught a particular form of martial arts, and killed his father. Ryo was left alone in the world except for his ageing grandmother and has been on the trail of his father's killers ever since. Clive has been helping Ryo out, as have tens of thousands of other people, most of whom, like Clive, have never been to Japan.

Yokosuka is across the bay, a very large bay, from Tokyo. It is also on the Dreamcast, which means it's time to analyze one of our favorite games. We'll use all the theories and models studied so far to analyze the game from various viewpoints and see what we can find out and how to put it all together.

SHENMUE

On the back of the box—containing no less than three CDs for the game itself and a fourth for the online extras—we find the following: "Open your eyes to the most compelling form of interactivity ever experienced outside the real world. Shenmue is a passionate and gripping story, captured in a beautifully rendered 3D world, brought to life using 'Magic Weather' and 'Time Control' technologies. Interact with a huge cast of characters with movements as intricate as a twitch of a finger, experience real-time fighting and discover the host of online features available. This is clearly not a game but an experience never to be forgotten."

This sounded great to Clive who, for one, certainly did find the experience memorable, and he is most definitely not alone. Of course we want to find out more about how the game works, why it works, and how it does and doesn't differ from other games. Does it live up to its publicity blurb?

Shenmue is a quest in which the hero, Ryo Hazuki, has to find his father's killers. To do this he becomes an amateur detective and must find out who knows anything about the events surrounding the murder. No one knows anything in great detail but there are lots of clues to be gathered by talking to the local people who all know

Ryo very well. He is part of a very close-knit community who respected his father and family. Later in the game, Ryo's investigations take him away from his local community and out into the big, bad world of Yokosuka and beyond.

The development of the game was produced and directed by Yu Suzuki who coined the term "full reactive eyes entertainment" (FREE) for the generic gameplay mode. In other words, the player should be able to do pretty much anything they would in the real world. You can follow the quest, or go shopping, talk to people, play on your Dreamcast, go to the amusement arcade, and so on.

From time to time Ryo comes up against baddies who are in some way connected with those who committed the murder and has to fight them in order to survive. All the clues Ryo uncovers and the contacts he makes are added to a notebook which can be referred to when necessary. He can also collect objects for later use, in true *adventure* fashion. There are many more activities for you to get Ryo to do in the game but we will go into those in detail when we consider agency.

GENRE AND ACTIVITY PROFILE

Let's first see how the press deals with Shenmue in terms of genre. Mostly they seem to classify it as *action adventure* but they encounter problems because of its genre-switching features; we discussed these in Chapter 2. So in some of the reviews you would think the game was an *RPG*; while in others you would think it was just a *beat-'em-up* and that all you did was wander around town until the next fight came along. Of course the fights do come along and you cannot avoid them but you won't get anywhere in Shenmue if you just wait for them and do nothing else. In fact, if you don't get out and about and talk to people the fights will not come along at all. Then there are also *driving* sequences and a lot of watching cut scenes. How does Shenmue match up as *action adventure* or an *RPG* even? Let's check its activity profile, presented in Figure 9.1.

The highest scoring activity is confronting, which is the only one to get a maximum score. There are then five middle ranking scores, in descending order: investigating, music, attacking, trading, and communicating. This is an interesting mix to say the least. Investigating, trading, and communicating all belong to strategy and tactics and are not only more measured activities but also very much what you do in the main FREE mode we just discussed. Attacking is of course very twitchy and quite in keeping with Shenmue's fighting mode. It is, however, unusual for music to score so highly in this type of game, but it does make sense because music in Shenmue is tied in so closely to cut scenes, changes of time of day, mood changes, and so on.

This is interesting, as confronting and investigating are actually quite separate in the game. The main exploration and puzzle solving mode is very definitely *action adventure* or *RPG*: you can talk to people, collect items and information, and perform a whole range of other non-twitchy activities, but you can't fight anyone. In other words, it is not *action adventure*. The action only comes out through the
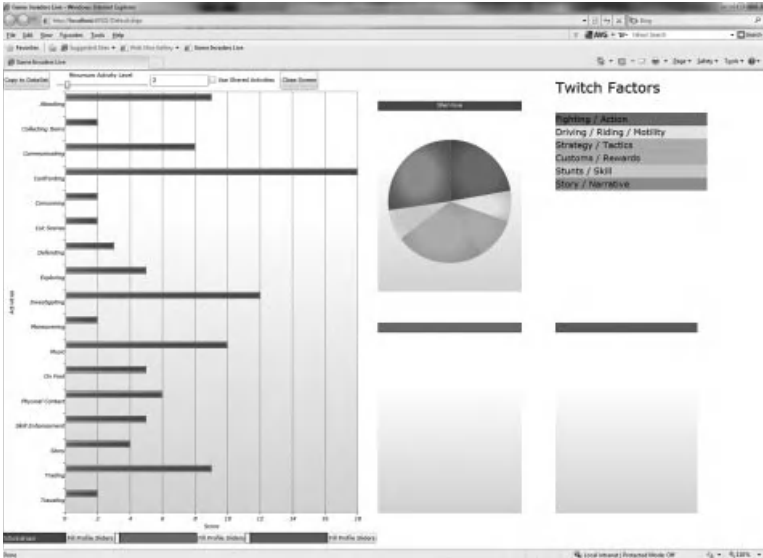
Figure 9.1   Activity profile for Shenmue on the Dreamcast. (See color insert.)

genre switching, which moves you to *beat-'em-up* or *driving* or a whole host of Quick Time Events (QTEs): Resident Evil also uses the latter, as we saw in Chapter 6. When you are going about town you cannot be aggressive. Later in the game we have to go to work and we are suddenly playing a *driver*—a *forklift-truck-driver*, to be exact. We gain agency typical of the driving genre at the expense of that offered by the *adventure.*

The lower-medium scoring activities, physical contact, exploring, on foot, skill enhancement, story, and defending, follow a similar pattern. We have physical contact and skill enhancement for the *beat-'em-up* sequences and communicating and trading for the predominant *adventure/RPG* sequences. In the *adventure* mode in particular there are lots and lots of things to do. Apart from exploring and talking to people, we have examining and purchasing inanimate objects; interacting with active objects such as doors, telephones, game consoles, and so on; buying food for and feeding a lost kitten; martial arts training; QTEs; watching cut scenes; and much more. The score of 4 for story supports this.

Finally, there are five activities scoring 2 that fill out the profile: collecting items, consuming, cut scenes, maneuvering, and traveling; all of which support the predominant *adventure/RPG* mode.

In fact, watching cut scenes is a very important part of the gameplay of Shenmue and we are often presented with this most passive of all activity types. We basically sit back and watch for seconds and even minutes at a time. There are no levels as such in Shenmue. The further aspects of the game open up when we have gathered enough information and defeated the requisite baddies in battle. Cut scenes come along depending on the point we have reached in progressing through the game, and

often the time of day, for instance. We are switched into and out of the *movie* genre as we are the other genres that make up the game.

It is not surprising given the mix of activities in its profile and the importance of the switching in and out of the *movie* genre that Shenmue has a twitch factor of 0.8, which means its gameplay is quite measured even though the player is switched into very twitchy fight modes from time to time.

So Shenmue is an *action adventure–beat-'em-up–driver–RPG–movie*; that's pretty clear, isn't it? In fact, that is pretty clear. Shenmue combines a whole set of traditional, game-based activities in a classic quest using genre-switching. That makes for a very interesting package.

AESTHETICS

In Shenmue we, the player, direct the principal protagonist, Ryo Hazuki, in his endeavors to find his father's murderers. Shenmue is a vast, interactive 3D virtual environment within which we have to search out clues that help Ryo in his amateur detective work. Aesthetically it is a very rich environment indeed so we will have much to discuss. There are also going to be some surprises; there have already been two: genre switching and movie watching.

First, of course, we consider agency and in particular intentions and perceivable consequences. We already noted in the section on genre that Shenmue employs genre switching which means that the nature of agency will depend on the genre or mode we are currently switched to. Our inclusion of the *movie* genre is also going to be substantiated as we study agency in Shenmue.

Imagine for a moment that we are in the main *adventure* genre, which offers us exploring, examining and purchasing inanimate objects, interacting with active objects such as doors, talking to people, and training. In the latter we practice moves for the times we are switched to *beat-'em-up*. The majority of agency in Shenmue is concerned with the first four. Despite the slight differences in their means of interaction, these four share a very interesting characteristic; they all reward our exercising agency with a prescripted action sequence (PSAS) which effectively, temporarily, removes the user's ability to exercise agency.

For instance, in the basic act of opening a door we have the following sequence of events:

1. We perceive an **attractor**, the door, within the field of view,
2. We form an **intention** to find out what is behind the door,
3. As we come within close proximity to the door the icon representing the red

   A button on the controller appears close to or over the door,
4. We press the actual red A button on the hand controller,
5. The game engine instigates a PSAS of Ryo positioning himself in front of the door, turning the door handle and opening the door, walking through the door, and then closing it behind him—the **perceivable consequence**,

6. The game engine then loads the files that represent whatever is on the other side of the door: our **reward**,

7. Within the reward we search for the next attractor and the cycle continues.

There are several interesting points to note here. It is quite unusual for the physical interface, the controller in the form of a graphic representing the red A, to be represented within the game itself. It should be a shock that reminds us we are in an artificial environment. It would normally remind players that this world is mediated and that button presses are analogous to walking and running, for instance. This technique is used extensively in Shenmue and extended in the QTEs where agency is very simplified, an obvious abstraction of the real world. The fact that for the vast majority of players the red A is not a shock but an enhancement of gameplay points once again to the positive role unrealisms often play in games. The encroachment of the red A into the game world is also used to highlight possibilities for agency that are not obvious from the game logic the player has so far encountered.

We do not always know the PSAS we are to get. If the door is locked we might get Ryo's thoughts; he might not want to knock because it is late and he does not want to disturb people. We might hear a request to "go away" from the other side of the door. This uncertainty of the outcome of exercising agency is used to great dramatic effect in Shenmue. Perceivable consequences and rewards are not always what we would desire or expect. False attractors can be great for gameplay.

Most interesting of all, though all from the above sequence, is that the perceivable consequence of exercising agency when in *adventure* mode—apart from when we are training—is always a prescripted, sometimes a prerendered, sequence. For instance, if we want to talk to someone, the perceivable consequence of pressing the red A when close to that person will be a question from Ryo followed by some sort of response, not necessarily helpful or polite, from the person he is speaking to. The conversation can often be continued by another press of the red A—after agency has been given back—which will result in another question and response.

Why is this so interesting? Well, in most computer games we would trigger a sensor or touch a switch and the door would open and we would walk through. We would type a question and wait for the response. But all this would be under our own volition and if we got in the way of the door we might accidentally stop it opening properly and perhaps be injured in the process. In Shenmue we lose control of the details of the act. Exercising agency is rewarded by removal of agency. The perceivable consequence is a cut scene.

As we have seen in the "opening door" sequence above, agency and POs are very closely linked. Let's jump straight into POs at this point and investigate Shenmue's strange form of agency further. Later on we will look at the wider ramifications.

SHENMUE POs

What do we look for in Shenmue? What kinds of attractors tempt us into forming intentions? The main attractors are:

- People: Not always in the same place, some people give directions, some have useful information, others don't, some are quite helpful others are very rude.
- Objects: To buy, that we find at home, that might be useful later, that are just distractions.
- Doors, lights, shop fronts, landmarks can lead the player toward major attractors, which are the source of conversations, etc.

And all these are often associated with the red A. In fact, the strongest attractors in Shenmue are complex attractors where an attractor of the kind just listed is juxtaposed with a red A; there is always a strong element of mystery or fear or desire associated with these.

In a game such as Shenmue we would expect a range of connectors to help us stay focused, remind us of what our principal intention currently is, remind us what objects we currently possess, and so on. Shenmue is no exception. There is a clock that is always in the bottom right of the screen and shows Shenmue time—part of the "Time Control" system lorded on the back of the box. We often have to meet people at particular times and Ryo has to return home at a sensible time each night. Remember, he is a dutiful grandson. The clock is very useful. Shenmue time has some interesting characteristics, but more on that later.

We can always open Ryo's notebook when in *adventure* mode and this lists clues we have discovered, phone numbers and addresses, questions we need to ask, appointments we need to keep, and so on. This comes in very handy; a great connector. Ryo also has a rucksack where he keeps a whole bunch of stuff he has collected or bought in the local shops; a typical *adventure* connector.

Another useful connector is the moped which Ryo can use to get around town faster and which also gives us another example of genre-switching, to *driver* this time. This saves time and keeps current intentions fresh in the mind. Otherwise we would have a lot of running around to do. Later on Ryo has to get the bus to the docks. Public transport is supposed to make connections, after all. Apart from these major connectors there are also the more usual ones of streets and pavements, shops, and other landmarks that guide and help us around town.

Let's move on to rewards. We already mentioned these when we discussed the "opening door" sequence. Rewards result from the perceivable consequences of trying to satisfy our intentions. In Shenmue they can be:

- The mental information you possess,
- Space,
- Your personal inventory,
- Conversations giving clues to help solve the mystery,
- Quickly learning that some people are more helpful than others,
- Learning that what people say to you depends on what you already know and who you have already spoken to, and
- Not just information for the main tasks but characterization (of different people), rejection, and friendship.

Many of the rewards in Shenmue are social; the game is a highly social space and one which is far more complicated than the "physical" space of the various neighborhoods of Yokosuka. But rewards are not the PSAS themselves, though they can be if the perceivable consequence is an extended cut scene. Rewards are what we make of perceivable consequences, what we find significant in them, and what leads us to select a new attractor to set the cycle off again.

We have not finished with POs or aesthetics for that matter yet. We will deal with choice points, challenge points, narrative potential, co-presence, and so on a little later after we have considered PSAS and cut scenes as perceivable consequences and their influence on gameplay a little more.

PSAS AND CUT SCENES

Let's make the distinction between PSAS and cut scenes clear. A PSAS is a short, prescripted action sequence, up to a few seconds long, that results from our exercising agency. It could be Ryo opening a door, or a question and answer session, for instance. Traditionally, a cut scene is a longer, usually prerendered sequence that offers information that will progress the storyline. They are similar but play different roles in Shenmue. PSAS are so integrated within the exercise of agency in Shenmue that many players do not realize they exist until they are explicitly pointed out. The only times that we are offered direct action in Shenmue are when:

- We are switched to *driver* or have chosen to ride the moped,
- We are switched to *puzzle* and thrust into a Quick Time Event (more below), and
- We are playing console or arcade games (in Shenmue),
- We are switched to beat-'em-up.

On a historical note PSAS were not new to Shenmue. They are actually the basis of the gameplay in standard *beat-'em-ups* where particular button press combinations trigger particular martial arts moves. In this way, PSAS go way back into the history of games.

Perhaps the opportunities for direct action are included as a kind of temporary respite from the PSAS and cut scenes. They give us more direct control but only when the Shenmue game logic allows it. Perhaps Shenmue is saying therefore that agency and narrative do not mix. This observation has been made by a number of people. The game is a story after all. We do not share that observation, as will quickly become clear.

There is another view. Perhaps what we have got in Shenmue is agency with integrated micronarrative components (PSAS) and that these support the more normal use of cut scenes proper, as is the case with other game types exemplified by Driver, Thief, and Unreal. All these games use cut scenes in a traditional video-game manner to put levels in context and tie in the next level or major level subsection, as is the case with Driver. The makers of Unreal 2, for instance, state quite categorically that "the story line is not allowed to get in the way of the action." In that game each level is introduced by an "interactive cut scene" in which we have

to talk to our support staff on the spaceship and find out about our next mission. When the level starts we are straight back into the *FPS*.

However, this is not the case with Shenmue. Cut scenes are activated at the user's command as a result of navigation and agency in general. There are many cut scenes in Shenmue but they are integrated into the gameplay which does not have recognizable levels. In fact, Shenmue leads us on a subtle dance, which involves offering agency and then taking it away—by a PSAS—because we exercised it. We are allowed to explore in our own time and, usually, to choose when and whether or not to exercise agency, but the perceivable consequence is a PSAS. There are other times when a cut scene is imposed on us, because of the game logic, rather than a direct response to agency. For instance, we get to a particular warehouse in the docks after trying to find it and then finding a way to sneak past the security guards and are rewarded by a beautiful cut scene in which we meet someone we have only spoken to on the phone. This person passes on a lot of very useful information. The scene is prerendered, using the game engine, and lasts quite a long time. We are switched to *movie*.

There are also little cut scenes where nothing much happens, which are very filmic, which we do not initiate but which tell us for instance that night has arrived—a tracking shot of the skyline at night, perhaps with the rain falling if that is part of the current "Magic Weather" pattern.

In fact, PSAS and these little interludes build up suspense as we anticipate new revelations regarding the protagonists. In this sense PSAS and miniature cut scenes can be seen in some way as analogous to the variety of shots which build up scenes in films. We are happy to sit back and watch a major cut scene because we are used to watching PSAS and mini cut scenes. This is the way narrative and agency actually work together in Shenmue.

Shenmue also makes use of interactive variations on the PSAS idea. Quick Time Events (QTEs), for instance, occur in certain situations and require us to recognize an icon representing a particular button on the game controller flashed up on the screen, and then press the actual game controller button within a fraction of a second. We usually get several goes at this until we get it right. Examining, picking up, and buying objects also works in a similar way to an interactive PSAS.

There are several forms of interactive PSAS:

- The fight scenes (QTEs) where we are required to press a button (icon flashing on screen) at the right moment in order to complete the PSAS in our favor.
- The various sequences where we are buying and accumulating objects, looking in drawers and cupboards, etc.
- Conversations where we need to press the red A in order to ask the next question and elicit the next response.

The various forms of PSAS are thus:

- Basic, uninterrupted PSAS.
- Interrupted PSASs, e.g., conversations, looking in cupboards, buying things to take or not, deciding to buy or not or to carry on talking or not.

- Interrupted PSASs with diverse outcomes (QTEs).
- Hiding PSASs in the old warehouse district.

There is even a game in the amusement arcade where we can practice our rapid response skills for QTEs.

We can see that PSAS, miniature cut scenes and cut scenes proper play an important role in the gameplay of Shenmue. Now we will think more about Shenmue as a story.

INTERACTIVE STORYTELLING?

In Shenmue, narrative is at the very heart of the basic units of gameplay as we have clearly demonstrated in the previous sections of this chapter. Agency is rewarded with narrative fragments. Multiple acts of agency are rewarded with the buildup of more and more of these fragments all of which in their own way contribute to the narrative potential of the game. Unlike typical *shoot-'em-ups* and *sneak-'em-ups*, narrative components are not simply used to frame individual levels or major subsections of levels. Narrative components are integrated into the game through the exercise of agency.

One of the consequences of this interplay of agency rewarded by narrative fragments is that the game can use extended cut scenes to introduce more substantial narrative material without interrupting the flow of the game. We are simply getting a bigger reward. Cut scenes can also be introduced for other reasons than agency.

The ambiguity of the meaning of the red A in the game space is part of Shenmue. Although it always indicates an opportunity to exercise agency, the reward for exercising that agency is not predictable. It is also an unrealism—a specifically designed infidelity. The red A attractors offer interesting possibilities, which help to establish narrative potential.

The streets and byways of Dobuita, for instance, offer a spatial maze, in much the same way as does a traditional s*hoot-'em-up*, but the true conceptual labyrinth (Murray, 1997) of Shenmue is a social one. There is an entangled web or rhizome of social interconnections that we have to uncover in order to progress and make sense of the quest Ryo has embarked on. There are a number or beneficial routes through this social maze and a subset of the opportunities offered by the red A act as way-finders, which only become apparent through social interaction. At any moment we are offered a number of potential red As, constant and multifarious choice points.

Narrative potential arises from the juxtaposition of POs, the basic units of agency. In Shenmue we are constantly confronted by choice points. We are almost overwhelmed by choices and spend a lot of time in the beginning knocking on doors and talking to everyone before we realize that our interactions need to be more structured. The only people worth talking to once we have gotten going in the game are the people whose names we are given as maybe having something useful to say to us.

AND ON WITH GENERAL AESTHETICS

We also eventually come up against challenge points—problems we have to solve in order to progress with the quest. Finding the phoenix mirror is a classic example:

1. We find out, or come to know somehow, that we have to find the phoenix mirror.

2. We gain access to the basement below the dojo and know that the phoenix mirror must be down there somewhere.

3. We note that Ryo is always concerned with light or the lack of it in the basement. He wants to light candles and use his torch.

4. We note that there are large gaps between the floorboards. Perhaps the mirror is underneath these. If we get a light bulb from the Tomato Convenience Store we might see the mirror's reflection when the light is better.

5. We buy and fit the light bulb but the mirror is not under the floor.

6. However, on scrutinizing the floorboards we notice that there are some scratches next to the small set of shelves near the chest of drawers with a mirror. By examining these scratches closely we enable a PSAS in which Ryo slides the furniture to one side and discovers a hollow part of the wall.

7. We know there is an axe he can use to break open the wall and retrieve the phoenix mirror. As usual in Shenmue, selecting the axe when all else is ready triggers a PSAS that turns into a cut scene.

A classic challenge point, but did the extra light from the light bulb cause the scratch marks on the floor to become visible? However, scrutinizing the scratch marks on the floor enables a red A which offers a PSAS if the red A is pressed.

Co-presence is a major aesthetic pleasure of Shenmue. Talking to people and discovering the different characters, as well as the information they may or may not have, is a major pleasure of Shenmue. It is also one of the main reasons for the rich levels of connotation in Shenmue because conversations and therefore language play a central role in the information space of the game.

How closely do we associate ourselves with Ryo? As a player one feels more distance between oneself and Ryo than one does with the characters we take on in Unreal or Thief. In Shenmue it is not really the player but the player in the sense of Gibson's "sensorium" (Gibson, 1984) or in the film *Being John Malkovich*. The player is not Lara Croft, nor is he/she Ryo. Somehow the player is more of a puppet master who is going to help and enable Ryo to achieve his quest. This is a clear case of transformation. How will Ryo think? How would he behave in this culture, which is so alien to most English players, but not to Ryo? This is not the player pretending to be Luke Skywalker but trying to put him/herself in Ryo's shoes in order to try and see the world from his point of view. In this sense Ryo, or rather his character traits, become a sort of filter on the world of the game we perceive and on our ability to exercise agency in it. Ryo's character is a prosthetic consciousness that is our only way of perceiving this alien world. There is thus a dramatic difference between the

character we play in Shenmue and the character we play in Unreal. We are truly role-playing in Shenmue. However, because we do not develop the character ourselves this is not an *RPG* in the video game tradition.

In general, there appear to be two types of transformation:

- Generic: Me as a Jedi Knight, football star, space marine, etc.
- Specific: Me as Luke Skywalker, Lara Croft, Ryo, etc.

In Thief, the player is the protagonist as a human who has strapped on a cyborg, steampunk exoskeleton. In Shenmue the player is not Ryo but Ryo's motivational essence. Ryo is the protagonist, not the player.

Despite the extensive reliance on agency, Shenmue has many of the characteristics of narrative. We have a plot based around the quest, a film genre (the detective story), we have characterization, and we have a beautiful evocation of not only the architecture of neighborhoods but also of the extensive social relationships which are the true heart of those neighborhoods. In Shenmue we have all these characteristics of narrative existing side by side with agency.

SUMMARY

Clive has never been to Japan and so exploring a "typical" Japanese neighborhood was fascinating for him. Yamanose actually reminded him of the kind of rural sprawl you find in many parts of Spain, for instance the areas just back from the coast near Gandia or Valez-Malaga.

Another of the pleasures of Shenmue is that it can also be a family or group experience; one person has the controller but everyone joins in with problem solving and exploration. Immersion/presence do not mean you have to be directly in control, just that you know this is happening right now and what happens next is up to you.

Learning is an important aesthetic pleasure of games in general. In Shenmue learning is of course important:

- Learning how to function and survive.
- Learning how to use the interface controls and recognize the role of the HUD. The interface controls do not at first seem "deep" in the sense that once you know what the red A or the yellow X mean, you cannot get better at using them. However, the QTEs introduce a whole new twist on this and turn undeep controls into deep controls. During the free fight interludes we have deep controls in the classic sense of the traditional *beat-'em-up*.

We also have to learn:

- To recognize the major classes of attractors: people, streets and turns, shop fronts and shop signs, street signs, objects in shops, etc.
- To recognize the onset of QTEs and how to respond to them.
- Which people are helpful; some in different ways.

The guy who runs the hotdog stand is helpful with directions. Some people are more likely to help us with the current question of "Where can I find a bar where sailors go?" There is a small risk involved in talking to people, many of whom do not want to talk and can be quite rude. This is actually quite amusing and actually constitutes a realism but our reaction to it is different from what our reaction would be in real life.

A few thoughts on shocks and unrealisms. Conversations are segmented and triggered by pressing the red A. The physical interface intrudes into the game space in a way which is quite unusual. One would think, for instance, that the intrusion of the red A into the perceptual space of the game would be counterproductive for presence—reminding us of the mediated nature of our actions—but this does not appear to be so.

Time passes far more quickly than in real life, an unrealism because it helps the gameplay. Depending on how quickly the player gets through the game or when they have certain conversations they may have to wait for considerable amounts of time. Wasting time can be best achieved by practicing fight moves, shopping, or playing in the games arcade. In these situations time passes even faster in Shenmue time.

Realisms abound in Shenmue:

- Ryo's grandmother's concern and commands,
- the passage of night and day,
- people behaving differently at different times of day, shops being closed, etc., and
- shadows, nightscape, weather, etc.

There are also definite shocks in Shenmue:

- The amazing number of people in Sakuraoka at all times of the day who cannot come to the door because they are just going to have a bath.
- We can't go down the road to Dobuita because we have to speak to someone before someone else can tell us to go to Dobuita.
- The clumsy way Ryo moves in confined spaces.

The fact that Ryo always asks the current question—or a version of it—can be strange, a shock, because there are times when you want to ask someone a previous question that you didn't get a chance to ask before. In a similar manner, there is a point at which you would like to thank Nazumi for the flowers but are not able to because of the encounter with the drunk and the problems at the Asis Travel Agency.

One of the interesting things about new communications channels such as videocassette or DVD is the way in which they change existing artifacts. The film *Blade Runner* achieving its cult status as a result of its release on videocassette is a fascinating example. Why? Because its release on videocassette gave the viewer agency, which allows the viewer to interrupt the director's flow of scenes and cuts and thus investigate the film at his or her leisure, speed, and ordering. Such agency disrupts

the original narrative form and turns it into an interactive mystery. The viewer can try and find out about the origami unicorn and other such figures, and can observe the mysterious red-eye effect seen in replicants and wonder whether Deckard therefore is a replicant. There are levels of meaning which remain largely inaccessible if we cannot disrupt the directorial narrative flow. But this does not invalidate the film as a film. We can and do always go back to view the film as the director intended in real time.

Blade Runner the film gave rise to Blade Runner the game, a classic *point-and-click* adventure that is a predecessor to Shenmue. The authors believe that Shenmue did in turn redefine the computer game by finding a way to integrate agency and narrative so successfully. We may well be talking about the *virtual storytelling* genre in the very near future. In its way, Shenmue raises the same questions as Rez, for instance, "Can computer games appeal to more sophisticated aesthetic pleasures than those offered by an *FPS* or a *beat-'em-up*?" I believe the answer is the same, "Yes!"—but for differing reasons.

One further point before finishing this chapter. At the end of the previous chapter we made the point that much of what we have been talking about here remains unanalyzed by the methods and theories we are working with. Toward the end of the previous chapter we observed that much of what allows us to make sense of a game like Driver relies on what we already know about the United States, organized crime, and so on. Of course, much of what we know will come from TV and films and not from any direct knowledge of or contact with gangsters. The same is true for Shenmue for Clive, who has never been to Japan. In order to make sense of such things, to make meaning out of them, we bring into play the knowledge and meaning-making strategies we use in the real world. It will be interesting to investigate the relationship between these and the theories introduced so far. That is the subject of the next two chapters; a significant further outcome will be an overall theory for video games. Read on.

FURTHER READING AND TASKS

All the references for POs and so on were given in the previous two chapters. As for tasks? We are sure you know what to do now. Continue with the SimCity Classic case study:

1. Use GIL to think about genre, twitch factor, and activity profiling. Does GIL have data on this version of OpenCity? If not, can you use the data GIL does have on later versions of the game to get an idea of Classic's activity profile and twitch factor?

2. How do these relate to the Table of Surprises and all that it reveals about the game?

3. With agency already firmly established, you can now go on to think about the rest of aesthetics: narrative potential, transformation, co-presence, and presence.

4. When you have done this, relate what you have just found out to what you found out in the previous chapter. Think about the discussions from this chapter concerning Shenmue and identify similar types of gaps in your analysis of OpenCity.

We will return to the OpenCity case study at the end of the next chapter.

Chapter 10

Meaning What?

When we play computer games we do so because they're fun. But they are only fun because we can make sense of them: they mean something to us. We recognize the worlds they depict, what we are expected to do in those worlds, and how we can make progress and in general play the game. There appear to be two types of meanings to be found in computer games. As we found out on a number of occasions throughout this book, very often the meanings we find in games relate not just to games but to what we know about the real world or fictitious worlds we know from other media, such as films. We know about crime and criminals, about civilizations in the distant future, about the aftermath of nuclear war, and so on. There are other meanings we find playing games that are specific to games: these kinds of meanings have to do with agency; finding things out by doing, by intervening, by affecting change. Much of what we have discussed so far in this book has to do with this second type of meaning. We make use of both types in finding overall meaning and thus finding pleasure in computer games.

In the next two chapters of this book we are going to study a general theory concerned with the way human beings find meaning in just about anything: in any situation they might find themselves, in any communications media they might find themselves using, in even mundane situations such as walking down the street or sitting on a train or bus. Human beings survive by finding meanings in the world around them. All sorts of theorists have attempted to find out how and why the making of meaning works for us. We can attempt to answer such as question in many differing ways. We could use neuropsychology and look at the way the brain functions in terms of cerebral structures. We could consider behavioral psychology and do experiments to see how people react individually to particular situations. We could consider social science and see how people in general react to specific situations. We could consider anthropology and observe how people behave in the real world and attempt to build a theory of what, in their makeup, determines these behaviors. XEODesign's work, as discussed in Chapter 6, is an example of this.

We are going to use semiotics. This is a theory that attempts to relate the way signs, things, in the world around us are perceived and the kinds of meanings we associate with them. Semiotics is the study of the nature of signs and groupings of

signs into novels, films, games, and so on—all are called *texts* by semioticians—and the way these groupings enable humans to make sense of them, to find meanings associated with them. Such meaning-making is a complex process but semiotics simplifies it in the sense that it does not attempt to look at brain functions as such. Instead it attempts to theorize about the nature of the meaning-making process and the types of meanings that humans seem to make in a more general sense.

Texts for semioticians can be such things as novels, films, and TV programs but they can also be facial expressions and body language; clothes, cars, and other consumer items; the look and feel of shops and suburbs; and much, much more. An important part of the way we find meanings in sign systems is to do with culture. Different cultures often find different meanings in apparently similar things. The differences of opinion between the Western world and the Islamic world are a good example of just this. Meaning is not absolute. We cannot come up with an algorithm and just calculate the meaning of something. We have to take into account the differing cultures of the people attempting to make meaning out of a particular text. We also have to take into account their individual backgrounds and tastes. Not all Muslims will see the world in the same way. Christians and atheists might well agree on a whole range of issues. Semiotics comes from the humanities, not science or engineering, but just because the meaning of a text will always be debatable rather than calculable, that does not mean we should not bother to study it. We can still learn from the process of rigorous study that a good theory makes possible.

Computer games are texts just as are novels and films. Of course they have their particular traits: they have animated graphics and are interactive, for instance. Semiotics can be very useful in finding out what computer games mean to people and why these people find the process of meaning-making (game-playing, in our case) pleasurable. It is no accident that the other theories we have studied in this book are all either semiotics-based or closely related to semiotics. We can use semiotics to draw them together and also to fill in the gaps of expression and explanation we identified in the previous chapter. We will make all of this clear as this and the remaining chapters of this book progress.

First of all, what on earth is semiotics? There are a number of important concepts in semiotics so we will introduce them gradually before applying them to a well-known game.

SEMIOTICS AND SIGNS

Semiotics is about signs, but not just signs over shops or road signs or direction signs; semiotics is based on a very simple, fundamental, general notion of a sign that applies to anything that can have meaning for us. In semiotics a sign is composed of two things:

- The *signifier*: The physical thing in the world that you can perceive.
- The *signified*: The meaning, in your mind, that you associate with the physical signifier.
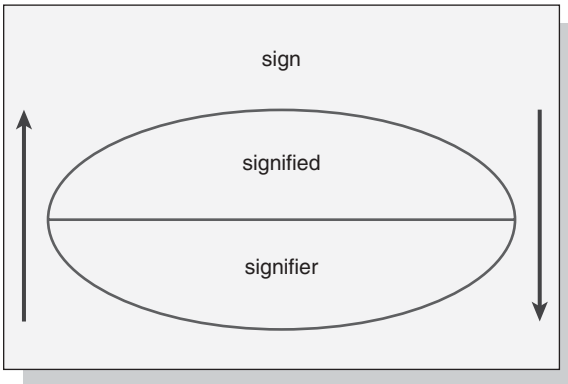
Figure 10.1   Characterization of the sign. (Courtesy of Daniel Chandler, Aberystwyth University.) (See color insert.)

So in essence semiotics is trying to make a link between the real world and the worlds of our individual minds and imaginations. The signifier can be anything we can come to be aware of in the world around us: it can be words, pictures, or facial expressions. It could be sounds we can hear that we might recognize as voices and words. It could be sounds that we can hear that we might recognize as birdsong and even a species of bird, if we are knowledgeable in that way. It could be a light switch we are feeling for in a darkened room. It could be a smell that we associate with Christmas at a grandparent's house long ago. Signifiers can be just about anything that we can perceive in the world around us.

Figure 10.1 is a classic characterization of the sign. The blue arrows are intended to mean that signs can be read in both directions. The signifier can lead to the signified, the meaning being conjured up in our minds, or various components of the signified can together lead us to the signifier. But in order for a signifier to be part of a sign it must have a signified; it must enable our minds to make a mental association of some sort. In semiotics, a sign is only a sign when it has both a signifier and a signified.

Figure 10.2 shows two pieces of clip art. (In fact, this is the first time Clive has ever found a use for clip art.) We can see two trees: the first is an image, a sketch of sorts, which most of us would recognize as a tree; the second is a word with which we associate the meaning "tree." Both images are signifiers and have the same—or at least a very similar—signified to do with "treeness." Different signifiers, but the same signified; two different signs. What about photographs of trees? Are photographs signifiers as well? Can photographs be parts of signs?

Figure 10.3 is, obviously, a photograph of a tree. We, the authors, don't know what kind of tree it is or where it is but it's definitely a real tree. It's also a signifier. It signifies the particular tree it is but it also signifies the general notion of "treeness," of all the things we might know and associate with trees: leaves, branches, trunks, roots, flowers, birds' nests, timber, fixing carbon, saving the planet, and so on. Photographs are just as much signifiers as drawings and words and they can all signify similar things, they can have the same or very similar signifieds.

Figure 10.2 Two signs for "tree." (See color insert.)

Figure 10.3 A photograph of a tree. (See color insert.)

Signs—the signs of semiotics, that is—are a disarmingly simple way of associating the world around us with what is going on in our minds. Of course, not everybody has the same signified for the signifier "tree," whatever form it might take. You might have good or bad memories to do with trees: you might have fallen out of one and hurt yourself, you might have climbed one to escape a from a giant

crocodile, you might have a beautiful cherry tree in your garden that blooms so spectacularly in spring, you might be an Inuit brought up in the far north of Canada and never seen a real tree. All this affects the kinds of signifieds we might individually associate with a given signifier. Semiotics is not a science. It does not give us unique answers. It is a good way of coming to understand things like books and films and games, but it doesn't give us "the answer."

PAC-MAN'S SIGNS

Pac-Man is full of signs. Pac-Man is signs! Table 10.1 gives a list of all the signifiers that make up Pac-Man, together with a signified for each. Each signifier–signified pair makes up a single sign. The signifieds listed in the table are the kinds of meaning we would derive from the signifiers of the game Pac-Man without thinking unduly in terms of games and without trying to come up with the ultimate meaning of Pac-Man. There is another set of signifieds for the same game, the same set of signifiers, which are more specifically to do with Pac-Man being a computer game.

Table 10.2 shows the kinds of meanings we would find in the signs of Pac-Man as a result of playing the game.

So, most of the signs in Pac-Man have two distinct signifieds: one that we recognize from our experience of the world around us, other communications media and so on, and one that arises from the basic act of exercising agency in the game. We all know this about most computer games anyway, although not all games have

Table 10.1   Basic Set of Signs for Pac-Man

Signifier	Signified
Pac-Man (inside game area)	Pac-Man signifies a character (a person?): his mouth opens and closes; he eats.
Chomping noise	Reinforces the notion of Pac-Man eating.
Beeping noise	Pac-Man moving and not eating
"Score" + numbers at top of screen	Some sort of scoring system
Pac-Man (below game area)	Two other Pacmen when the game starts
Small yellow dot	Could be seen as representing food, Pac-Man's ordinary everyday food.
Large yellow dot	Bigger food, means Pac-Man can now eat ghosts
Ghosts (brightly colored)	Active, threatening
Ghosts (pale blue, blank expression)	Stunned or mesmerized, can be killed.
Ghosts (flashing)	Danger, returning to life
Pair of eyes	Bodiless ghosts returning to their home.
Blue lines	Delineate navigable areas
Exit left and right	Teleporter to other side of game area
Fruit	Special luxury food
Numbers	Appear when something is eaten and then disappear

Table 10.2   Game-Based Signs for Pac-Man

Signifier	Signified
Pac-Man (inside game area)	Playable character
Chomping noise	Pac-Man accumulating points
Beeping noise	Pac-Man moving but gaining no points
Score	Total points accumulated by the player so far
Pac-Man (below game area)	Extra Pac-Man lives for the player
Small yellow dot	10 points when Pac-Man eats it
Large yellow dot	100 points when Pac-Man eats it, also a power-up, he can now "kill" ghosts
Ghosts (brightly colored)	Enemies that can kill Pac-Man, nonplayable characters
Ghosts (pale blue, blank expression)	Enemies that can be eaten/killed; 200 points
Ghosts (flashing)	Enemies changing back to killers
Pair of eyes	No threat or points
Blue lines	Restricts where Pac-Man can go
Exit left and right	Escape route
Fruit	200 points, 300 points, etc. when eaten
Numbers	Points gained by Pac-Man for eating something

this dual signifying system quite so clearly on display. We will return to this after we have added a little more structure to signs in the next section.

ICONS, INDEXES, AND SYMBOLS

Earlier in this chapter—when we were thinking about trees—we noted that different signifiers could denote the same signified. A clip art tree, the word "tree," and a photograph of a tree could all denote the same signified, "treeness." We can take this observation further and identify different modes of signs according to the relationship between their signifiers and signifieds:

- Icons: In which the signifier represents the signified mainly by its similarity to it:
  - Film is highly iconic
  - Road signs are highly iconic
  - Photographs, particularly holiday snapshots and the like, are highly iconic.
- Indexes: In which the signifier has some causal relationship to the signified:
  - A footprint in the sand denotes the presence of another person
  - Hollywood films, particularly in the 1930s and 1940s, used indexes extensively: falling calendar pages to denote the passage of time, quickly turning steam train wheels representing travel and distance, or marching feet representing an army.

- Symbols: The signifier is arbitrary, the signifier denotes the signified by convention:
  - The words in this text are symbolic: there is no direct relationship between the word "tree" and its signified to do with "treeness"; other languages will have equally arbitrary signifiers to denote "treeness"
  - Mathematics is highly symbolic, many different cultures over the millennia have used different symbols to represent the same mathematical concepts.

We can see all these modes of sign at work in Pac-Man:

- Icons
  - Cherries, strawberries, and other fruit
  - Ghosts are iconic to some extent; they look like the classic idea of ghosts
  - Pac-Man's extra lives are iconic, he is exactly like himself.
- Indexes
  - Pac-Man's mouth represents the whole character; it's only from the mouth's behavior that we begin to discern a character
  - The chomping sound signifies eating, reinforcing Pac-Man's indexic mouth
  - 2D blue lines represent walls because of the way they constrain movement but don't look much like walls
  - The moving eyes of the ghosts are indexic, as they denote a sentient being.
- Symbols
  - Pac-Man's "food" is symbolic, it doesn't look much like food even though his mouth devours it
  - The number representing the current score is symbolic
  - The word "SCORE" is symbolic
  - The association of points with various signifiers is symbolic, the number of points associated with fruit and ghosts we have killed, for instance, is arbitrary, we only come to know this by playing the game.

We can see that there is quite a balance of signs of various types in Pac-Man. We have strongly iconic meanings, strongly symbolic meanings, and strongly indexic meanings. Sounds are often indexic in computer games; they can signify a creature or a crowd of people without the presence of any visual signifiers. Very often these various modes of signs are associated with the same signifier. The ghosts have iconic meanings—this is how we recognize them as ghosts—but they also have symbolic meanings as points to be won. In fact Pac-Man seems to operate on two almost disparate levels: the iconic–indexic and the symbolic. In the end the symbolic wins out for most players and Pac-Man becomes a game of points and lives. The limited procedural, spatial, and encyclopedic features of the game (see Chapter 4) mean that narrative potential, transformation, and co-presence lack depth and become increasingly irrelevant.

The tension between the iconic–indexic and the symbolic manifests itself in many games: *shooters* and *beat-'em-ups* are good examples. A typical *beat-'em-up* provides a clear illustration of the tension between the iconic–indexic and the symbolic. Injury and nearness to death are symbolic, numerical values calculated by

algorithms. The player makes moves that are iconic and if successful is rewarded symbolically with frags or points; damage or injury is numeric. Sometimes the symbolic feature is represented iconically: an arm won't respond as the player would like, blurred sight impairs agency, and so on.

Sometimes there is no tension: Tetris is almost purely symbolic; a pure racing game is almost entirely iconic—there might be a HUD but it only represents to us the number of laps we have completed. Shenmue and games like it are largely iconic–indexic; Shenmue certainly is in its *adventure* mode.

You might think that modern 3D games would be more iconic than symbolic but that is by no means always the case. Very often properties of playable characters and NPCs will be represented symbolically even though their avatars and behaviors are iconic. This is nowhere better illustrated than in *RPGs* where setting up the often extensive range of numerical values which represent the various attributes of a playable character are the game itself for many players.

Another example is Doom, where health is both iconic and symbolic and an increasingly bloodied face in the HUD gives one indication of health while a number between 0 and 100 is the "real" value. Health and its vehicular corollary, damage, are usually represented symbolically either as a number or as a dynamic bar chart as in Driver.

DENOTATION, CONNOTATION, AND MYTH

We have just seen that the same signifier in Pac-Man can have two signifieds simultaneously: what it denotes in terms of what we know about the world and what it denotes in terms of gameplay, points, playable characters, NPCs, and so on. In fact a sign can have many levels of meaning and this is very much true of Pac-Man. The straightforward or obvious meanings from the first two tables are normally called denotations. We recognize Pac-Man's mouth through its basic behavior; we recognize the ghosts and the fruit and so on. The points and other basic gameplay-based meanings associated with the same signifiers in the second table are also on the level of denotation.

There are other additional, higher levels of meanings that add richness and complexity to the game. These operate on the level of connotation. We have already introduced both the terms denotation and connotation in the glass vial section of Chapter 5 and used them to differentiate game content concerned with perceptual opportunities: surprises are connotations while sureties are denotations. Just consider the range of meaning of both types that the simple dining chair could play in a whole variety of games. The two terms are useful because they are such a natural way of talking about different types of meanings of things.

In Pac-Man there are levels of connotation that build upon the level of denotation, both iconic–indexic and symbolic, we have just identified and discussed. In fact, Pac-Man was one of the first computer games to have such a rich set of levels of meanings and this in turn was an enabling factor for Pac-Man to connote a game character; probably the first true personality in a computer game. Characters do not

just exist in their own right, they have to belong somewhere; characters exist in an environment which enables them and which they in turn enrich.

Let's go through the signifiers found in Pac-Man but this time draw up the signs in terms of associations between signifiers and their connotations (Table 10.3).

We observed in Chapter 3 that Pac-Man was lacking in terms of the spatial and encyclopedic characteristics that underpin interactive aesthetics. In this chapter we already observed that the consequence of this is that Pac-Man very quickly becomes a game of accumulating points and protecting "lives" while the environmental context of Pac-Man fighting the forces of evil soon becomes lost. However, in terms of levels of meaning, of levels of connotation beyond the level of denotation,

Table 10.3   Signifiers and Their Connotations in Pac-Man

Signifier	Signified
Pac-Man (inside game area)	Consumption, we are what we eat. Pac-Man is a creature who consists only of a mouth, this coupled with his very basic behavior enables us to connote him as a "character"
Chomping noise	Reinforces the notion of rampant consumption. Pac-Man's sole concern is eating. He has no manners or discretion
Beeping noise	Connotes activity, Pac-Man responds to our wishes by moving and eating when he can. Reinforces the visual signifier of movement
Score	A reference to arithmetic (counting) as a system of meaning
Pac-Man (below game area)	Connotes rebirth, the transcendence of our usual, mortal human state, a welcome unrealism
Small yellow dot	Could be seen as representing ordinary everyday food. Why is Pac-Man's food the same color and more or less the same shape as he is?
Large yellow dot	Connotes special foods with special properties, a power-up, analogous to Popeye's spinach maybe?
Ghosts (brightly colored)	Fear, the unnatural. Reference to superstition and folk legends about the supernatural. The active eyes help to connote the presence of purposeful life forms
Ghosts (pale blue, blank expression)	Stunned or mesmerized. Their staring eyes and twisted mouths are somehow reminiscent of stupor or mental deficiency, the look of zombies with unblinking eyes
Ghosts (flashing)	Flashing lights have all sorts of connotations with emergencies and emergency services, alien space craft, etc.
Pair of eyes	Lost souls returning to their place of origin
Blue lines	The color blue for the "walls" reinforces other connotations of night and the supernatural, as does the black background to the whole game
Exit left and right	Connotations of teleporting and the supernatural
Fruit	Special, luxury foods; treats. The bright primary colors of the fruit seem to reinforce the notion that they are special

Pac-Man is a game ahead of its time. Within a very simple 2D, nonscrolling graphics context we have a very rich world of connotation in which Pac-Man, the ultimate consumer, tries to overcome the forces of the supernatural in order to keep on consuming.

In semiotics, myth refers to meanings, signifieds and connotations in particular, which seem to be so natural that we do not question them. In Pac-Man we find two very common myths of contemporary society connoted:

- Consumerism (capitalism): despite the frightening situation he finds himself in, Pac-Man only exists to consume, he is willing to risk his life (lives) to do so.
- The Supernatural: ghosts, disembodied spirits, haunted houses and so on represent the threat to Pac-Man's very reason for existence.

Pac-Man will continue to consume as long as he can continue to outwit the forces of evil, which are ably represented by the myth of the supernatural which might itself be intended to connote communism or totalitarianism. Remember, Pac-Man first appeared at the height of the Cold War. In its own way, limited by the technology of its time, Pac-Man may well be seen to be playing out the myths that constituted the Cold War, which dominated all aspects of life in the days when it was built.

In computer games, myths are very often exploited to present the context within which the gameplay will operate. Sometimes such myths are an integral part of the narrative potential of the game—as in classic Japanese *RPGs*, for instance.

SYNTAGMS AND PARADIGMS

Of course, when we read a novel, watch a film, or play a computer game we don't just make sense of a single sign at a time; we are constantly making meaning out of the various groupings of signs we come across. In films, for instance, such groupings might be the arrangement of people, vehicles, props, and so on in a scene—the *mise-en-scène* in European cinema—or it might be the arrangement, the cutting together, of individual film clips—montage, in European cinema. The grouping of signs and their changing relationships is just as important a factor in computer games and gameplay. In semiotics such relationships between signifiers are called syntagms; relating to the importance of syntax in the writing of novels and other printed word media. But syntagms don't have to obey the same strict rules of syntax as written or spoken languages.

Differing media will be governed by differing syntagmatic relationships between signifiers. In novels the relationships are linear and static; the words in a novel don't change places while you are reading. In films we have groupings of signifiers that appear on the screen at the same time and groupings of signifiers that are ordered in time as the film is projected. The former are called synchronic (synchronized) relationships while the latter are called diachronic (over time). Similar relationships govern computer games which have notions related to *mise-en-scène* and montage.

Table 10.4   Relationships between Signifiers in Pac-Man

Signifier	Signified
Small and large food dots left in the level	Records how close, or not, the player is to finishing the level
Pac-Men below game area	Number of extra lives left in this level
Position of all the ghosts in relation to Pac-Man in the playing area	The current threat to Pac-Man and thus to the player
The first five signs in Tables 10.1 and 10.2 above	Together these signify to us all we know about Pac-Man: where he is, what he is doing, how successful he is in the game as a whole, and how many lives he has left

The big difference of course between film and computer games is that in the latter the player has some control over the syntagmatic relationships between signifiers whereas in a film these relationships are determined by the director when the film is shot and then edited.

Table 10.4 lists the major synchronic, syntagmatic relationships between signifiers in Pac-Man and the connotations most of us would attribute to them. Because these relationships are synchronic they tell us about the state of the game and a particular level at particular moments in time: the current score, the number of lives left, the current threat to Pac-Man, and so on.

There are also diachronic, syntagmatic relationships in Pac-Man:

- Ghosts turn from active, to mesmerized, to active, to numbers (points), to pair of eyes, and so on. What we have here is a sort of life history of an individual ghost in Pac-Man. We, the players, make the association between a series of signs from which we construct a particular NPC.

- The relative positions of the ghosts and Pac-Man change as a result of how the player directs Pac-Man and of the individual behaviors of the ghosts.

- Cherries and other luxury treats appear and disappear.

- Pac-Man opens and closes his mouth as he moves; at the same time we hear beeping and chomping noises to correspond with what he is doing.

- The remaining food (state of the level) diminishes as Pac-Man eats his way through the level.

In computer games, diachronic relationships tell us about the development of the game, of our successes and failures, of the changing relationships between playable characters and NPCs, and the realization of narrative potential. In a simplistic sense we could characterize gameplay as the diachronic relationship between syntagms. One syntagm—a snapshot of the signifiers representing the current state of play—leads us to form the intention to achieve a different, more desirable syntagm. In a sense all gameplay breaks down to this: just think of attractors and rewards,

intentions and perceivable consequences. We won't go into the relationship between semiotics and gameplay further at this stage, as that will be the subject of the next chapter.

When we are considering the relationships between signs, semiotics identifies another very important relationship which may be less obvious but is nonetheless highly influential on the kinds of meanings we attribute to signifiers. The paradigmatic relationship between signs is the relationship between those signs we find in the game and those we do not. At first sight this might seem ridiculous; there are far more signs that aren't to be found in the game than are; how will considering all these be of help us? Well, the idea is that for every sign present in a game there would have been a set of other signs that could perhaps have done the job as well, so why weren't they chosen instead? When we play a game we are aware of some, probably not all, of the signs that could have been chosen and this knowledge influences the kinds of meanings, connotations in particular, that we make.

There is a little test or thought experiment—the paradigmatic test—you can easily carry out by asking yourself the following kinds of questions about Pac-Man:

- Why ghosts and not space monsters, lions, or missiles, for instance?
- Why cherries and strawberries and not hamburgers and hot dogs?
- Why does Pac-Man look like a pizza with a slice missing and not a piece of pie with a slice missing or a chocolate bar or a steak?
- Why not depict Pac-Man as a vacuum cleaner?
- Why does the food scattered around not look like cakes, slices of bread, potatoes, or other types of food?

Let's take two of these. First of all, imagine Pac-Man as a pie and as he moves a slice of pie disappears and appears to denote a mouth and connote eating. What has changed in terms of connotation? For one thing, we have lost the general connotation of pizza as fast food, as an integral part of consumerism; pizza is synonymous with these. Pie has quite differing connotations to do with small-town America, the traditional home, and so on. So if we change pie for pizza we retain the connotations to do with food and eating but we lose the myth of consumerism. The point of paradigmatic analysis is that the players will have in the backs of their minds the knowledge of what choices were made and what weren't and this will affect the kinds of meanings they construct. In this context, representing Pac-Man (or Vac-Man, as he might have to be called) as a vacuum cleaner would have been even more inappropriate.

How would the game change if the ghosts were to be replaced by missiles, for instance? We would lose the haunted house connotations and the myth of the supernatural for a start. A house with slow moving, intelligent missiles could be pretty threatening but would not generate a coherent pattern of connotations that counteract the myth of consumerism that Pac-Man and his activities so cleverly connote. The point is that not only are we aware of and actively constructing the connotations and myths that the game of Pac-Man as a whole offers us but we are also aware of

how different the game would have been if some or all of these signs themselves had been different; if there were different signifiers leading to similar but differing signifieds.

When thinking about the relationships between signs in games we should consider both the paradigmatic and the syntagmatic cases. Particular groupings of signs that are present will give us important information concerning the current state of play of the game. The relationship between signs that are present and those that could perhaps have been but are not influence, and hopefully reinforce, the meanings we make of the signs we can perceive. Both cases can usefully be considered.

CODES

Before we go on to apply semiotics to some of the other games we have already discussed in previous chapters there is one more concept that we need to consider. How is it that we know how to interpret certain signs in certain ways? For instance, how do we recognize the two differing meanings associated with the same Pac-Man sign in the gameplay area itself and below the gameplay area? Of course we know the first is our playable character and the second the number of extra lives we currently have; but how did we know this? Would we have known this if we were not familiar with games?

The answer to the second question is probably no. The answer to the first question is that in playing games we have learned some general principles about how they work and in particular about how to attribute meaning to the signs we find in them. We have learned some rules that allow us to engage in meaning-making in the first place. These rules are known as codes in semiotics and it is the codes that allow us to decode signs; to make meanings of them. For instance, we quickly learn a code which allows us to work out who and what we are in the game world. Are we an icon such as Pac-Man or a spaceship in Spacewar? Do we have a first-person point of view and thus don't see (much of) ourselves in the game, instead having only our eyes' view into that world? How do we put together the current state of the game and our relative success or failure so far: do we just get it from the playable character's position? Is there other information that we need to monitor and how is that information made available to us; is there a HUD, for example?

Game genres suggest one important set of codes that allow us to work out what we have to do and how to monitor success and failure. The *click-and-play* genre, for instance, informs us about the nature of agency, the highly stylized form of movement, the puzzle-based nature of the game, and so on. But different *click-and-play* games can be very different in other respects. They can be stylistically very different. Consider Blade Runner and Grim Fandango, for instance. They both share the basic *click-and-play* genre characteristics but accomplish them in very different ways. Blade Runner adopts codes of presentation from the film of the same name which is its antecedent: we have film noir lighting codes, camera work, and characterization codes; we have a sci-fi plot and themes; we have highly realistic puzzles that relate directly to the complex plot to solve. In Grim Fandango's case

we have a cartoon-like world with a 1930s private investigator setting without the film noir codes, puzzles that are by no means plot dependent, and so on.

Genre is one important code for computer games but any game will employ a number of codes which help us to find the necessary set of meanings in a game that will allow us to play it and enjoy it. We might have, for instance:

- Genre
- Myth and back-story: What myths, in the semiotic sense, does the game draw on as a basis for gameplay?
- Mode: Text, 2D projection, platform, 3D, etc.
- Agency: What do we actually have to do?
- Player representation: How is the player represented in the game (icon, first/third person, cursor, etc.)?
- Controls: How do we do put agency into practice?
- Symbolic level: Points, frags, lives, health, damage, and how these are integrated with the mythical world which is the game's context. Is there a HUD, for instance?
- Game state: How does the player know how well they are doing, what are the current threats, where/what is the end?

All these are codes which the game player will be well aware of. They may be manifest in different games in very different ways but a seasoned player will be aware of these codes, however intuitively, and recognize and be able to make use of them. In the next chapter we will explore the notion of semiotic codes in more detail with particular respect to the nature of interaction.

Chandler (1994) puts forward a classification of codes in general for all communications media:

- Social Codes: In a broad sense, all semiotic codes are "social codes."
  - *Verbal language* (phonological, syntactical, lexical, prosodic, and paralinguistic subcodes)
  - *Bodily codes* (bodily contact, proximity, physical orientation, appearance, facial expression, gaze, head nods, gestures, and posture)
  - *Commodity codes* (fashions, clothing, cars)
  - *Behavioral codes* (protocols, rituals, role-playing, sports and games)
- Textual Codes: Codes of representation.
  - *Scientific codes*, including mathematics
  - *Aesthetic codes* within the various expressive arts (poetry, drama, painting, sculpture, music, etc.), including classicism, romanticism, realism
  - *Genre, rhetorical, and stylistic codes*, narrative (plot, character, action, dialogue, setting), exposition, argument, and so on
  - *Mass media codes* including photographic, tele-visual, film, radio, newspaper, and magazine codes, and games of course: both technical and conventional (including format)

- Interpretive Codes: To do with both psychology and culture.
  - *Perceptual codes*, e.g., those of visual perception
  - *Ideological codes*, more specifically, we may list the "isms," such as individualism, liberalism, feminism, fascism, materialism, socialism, objectivism, and populism.

We can see that the codes for computer games that we have been discussing so far are textual codes of mass media to do with the kinds of communication interactive media such as computer games afford. Remember, "text" in semiotics refers to anything in which we can find meaning and so could be a film, novel, TV program, and so on. In a very real sense this book is an investigation of the codes we need to be familiar with if we are to fully understand computer games.

In support of the mass media code for computer games we have also been talking about most of the other textual codes in one sense or another: aesthetic codes which deal with general approaches to the representation of game worlds; genre and stylistic codes which govern particular approaches to building game world content; the code of arithmetic for symbolic representations of health, wealth, damage, scores, and so on.

However, one of the reasons for studying semiotics in the context of computer games is that to fully understand how people make sense of and find pleasure in computer games we need to employ a whole range of codes, social and interpretive as well as textual. Many of the questions we left unanswered in Chapter 9 can now be answered by considering codes from outside the confines of the textual mass media codes of computer games. It is easy to see just how important the whole range of social codes, particularly verbal, bodily, and behavioral codes, are to playing the majority of computer games. This is particularly so with the increasing inclusion of role playing in a whole range of games.

There is another way in which games can make use of codes and this is the notion of the intertextual code that is the borrowing of textual codes from other communications media. We noted that *Blade Runner* does this quite cleverly by employing various codes from film noir for such things as lighting, framing of scenes, plot, and characterization. Intertextual codes can be a very effective way of enriching the context of a game by making references to other media we know and understand.

In fact the whole notion of games derived from films is a premeditated use of intertextual codes as marketing tools. The pod racing episode from Star Wars: Episode One is a quite blatant example. You would have thought that two Jedi Knights would have found a way of getting their spaceship repaired without having to rely on and risk the life of a young boy; and did it really require a full half hour of the film? The only possible justification is to sell the pod racing game that was an integral part of the film's marketing strategy. The intertextual swapping of codes in this case is bidirectional: the pod racing track with its huge grandstands, elaborate canyons, tunnels, and rock arches exemplify a very familiar code for the presentation of racing games; the game itself makes reference to the plot and characters and other, more general filmic codes of sci-fi.

We even find intertextual code swapping in Pac-Man. We already discussed the myth of the supernatural and its references to film and novels. Another excellent example of using codes in this way is the representation of the luxury fruits that offer extra points. Their presentation is reminiscent of the fruit to be found in one-armed bandits, slot machines, which promise money to be won but at a risk—you might lose it all. In Pac-Man getting the points the fruits offer is very attractive indeed but there is a very great risk attached—you might lose your life (well, the current one, anyway). Now we can see the paradigmatic choice of cherries and strawberries represented as they are. They make an intertextual code reference to amusement arcades and gambling and in doing so connote risk. Other icons for foodstuffs might well have worked equally well at the level of denotation—we would have recognized them—but they would not have offered risk as a connotation.

MAKING UP PAC-MAN

Let's finish our work on Pac-Man by considering Pac-Man himself, or rather the process we, as players, go through in order to see Pac-Man as a playable character rather than some anonymous pointing device like the cursor in Windows-based programs. We already saw that each ghost in Pac-Man is a signified constructed by the player from a number of distinct signifiers.

Why do we see Pac-Man as a character? If we compared Pac-Man with other games from the classic era you would not see the lunar lander in Lunar Lander as a character even though it represents the player in the game. It is a machine you fly, but not a character. The same is true of the vast majority of games of that era and the way the player is represented in them. Let's start at the beginning and consider how the process of character building might operate in this case.

Pac-Man's basic signifier is a yellow dot that alternates with a yellow dot with a slice taken out of it when we, the player, cause it to move. Seeing the slice alternately disappear and appear seems to suggest that the signifier is signifying pizza. Toru Iwatani, the games designer, was in fact inspired by a partially eaten pizza. We have already discussed the fact that this signifier denotes pizza and connotes food, fast food, in general.

Pac-Man can move but only if we command him to. In the case of this game we can simply give him a direction to move in. But as he moves his mouth opens and closes and he makes noises: a chomping noise if he bumps into one of the little yellow dots, a beeping noise if he does not. We cannot control this aspect of his behavior. Pac-Man does behave autonomously to a certain extent. The mouth opening and the chomping noise syntagmatically suggest the connotation of eating. Pac-Man is a playable character represented by an autonomous mouth and a certain autonomy of movement.

Most people do not see Pac-Man as just a mouth, however; they see him as a character. One of the textual codes is the rhetorical code, which contains various figures of speech: metaphor, metonymy, synecdoche, and irony; these have to do

with the way we make meanings out of texts. You should be familiar with metaphor and irony but might not be so with the other two, although I guarantee that you use them all the time.

Metonymy is the part of speech that replaces the object we wish to refer to with something related to it. On the news, reporters will say "Westminster" or "Washington" when they mean the government or they might say "number 10" when they mean the Prime Minister. These are both common examples of metonymy.

Synecdoche is similar to metonymy but is characterized by "part for whole" or "whole for part" relationships. When you ask someone if they have their wheels with them you really mean their car, or when you say, "I was stopped by the law," you mean one police officer and not all of them and their support staff and the justice system and so on. Pac-Man is a synecdoche; his mouth stands in for his whole body.

That he is signified as whole person is supported by the fact that he can be commanded but also has autonomous behaviors. But there is more; Pac-Man can be killed, can be reborn, can get power-ups and threaten the ghosts; we have a simple and rather violent society here in which he is the principal because he is the playable character. So in a very real sense Pac-Man is only present as a disparate set of signifiers, denotations, and connotations that allow us, the player, to build him in our minds. It turns out that this is true of all playable characters. Pac-Man is an instance of the code of the playable character, an integral part of the code of interaction that we will begin to study in the next chapter.

FILLING GAPS

By way of an illustration we have applied semiotics to the analysis of Pac-Man in some detail and for good reasons. Pac-Man is an interesting and highly influential game. Our theories to date bring this out clearly. Semiotics seems to have completed the picture that we were building up through our other analyses. In Part I of this book, we studied a number of other games using the theories we introduced. In doing so we raised a number of questions that those theories did not appear to answer. Let's pick up on four of these games, Spacewar, Rez, Driver, and Shenmue, and see how semiotics can help us complete the picture for these as well. There were a number of issues raised in earlier chapters that semiotics can resolve—for instance, the role of the codes of film in the narrative potential of Shenmue.

One of the reasons Spacewar was so successful was the way it evoked deep space so beautifully despite the extreme limitations imposed on graphics and processing power. There are a number of contributing factors to this: the clearly recognizable spaceships and their graceful movements, the gravitational pull of the little sun, and the backdrop of stars and the void of deep space. The fact that the spaceships are recognizable as spaceships is an intertextual reference to comics, sci-fi films, and the like. The spaceships, launch rockets really, belonging to NASA and the USSR in those days looked very different from the two we are offered by the game. By referencing codes from other storytelling media the game's builders enable

us, the players, to draw on a whole wealth of meanings to do with fictitious future societies and their advanced technologies.

The backdrop of a black screen with just a few white pixels signifying stars is not only very effective but was just about the only backdrop that was possible. We have already discussed the compelling nature of the spaceship's elegant movements, the result of the inertial physics model and the way the spaceships respond to the few simple commands. All this very beautifully signifies weightlessness which in turn is a signification of space travel and deep space. This is a very simple package by today's standards but is still a very effective one.

The intertextual reference to comics and sci-fi films rather than the reality of the NASA space program, the inertial physics, and the stark interstellar backdrop all cleverly evoke the myth of space travel. Space travel is a myth because we take it as a given that one day humans will really travel between the planets and other star systems the way they do in mass media. Space travel seems so natural to us that we do not seem to wish to question its very possibility. At present science seems to be saying that to travel beyond our own solar system may not be possible at all, let alone practical. Voyager II has taken over thirty years to reach the edge of our solar system and will take hundreds of years to reach another. Interstellar space travel is a myth that Spacewar cleverly evokes and subverts to its own purpose.

Finally, Spacewar illustrates an important aspect of semiotic theory that we have mentioned but in no great detail; the notion that signs gain their meaning in many cases simply because their signifiers are different from other signifiers. The words "tree" and "free" both have well understood signifieds to English speakers but the signifiers themselves are arbitrary; they only map onto their respective signifieds by convention, a cultural convention that has grown up and evolved over hundreds of years. The two spaceships signify difference rather than good or bad, alien or human.

If we put this general semiotic analysis alongside the aesthetic analysis we conducted in Chapter 3 we get a pretty complete picture of how and why Spacewar works.

The question we posed toward the end of Chapter 4, "Two Rail-Shooters," was essentially, "How do we explain the additional aesthetic levels that Rez appeared to exhibit?" The question is not a simple one to answer. For Tetsuya Mizuguchi, the game's lead developer, the additional aesthetic levels were derived from the aesthetic ideals of the synesthesia school of artists, painters, and composers; in particular the painterly aesthetic of Kandinsky. From synesthesia we get the notion of sounds evoking visual images, visual images evoking vibrations, and vibrations evoking sounds (and so on and so on). Synesthesia as statement of intent by a group of early twentieth-century artists and composers is in many respects a desire for, a prediction of, the kinds of "artworks" that computer games at their best can realize.

From Kandinsky's style of painting, we also get the visual aesthetic of Rez. From trance music we get the musical aesthetic, the particular musical codes that govern the game's soundtrack. But there is a problem here. Many game players will be familiar with the musical codes of trance music; it is a major part of youth culture. This is not even an intertextual reference; the music in the game *is* trance music and was written by musicians who work in that genre. The player does—partially at

least—construct trance music and trance music has connotations of pleasure, of clubbing and partying.

But how many players would be familiar with the codes that comprise synesthesia or those for Kandinsky's particular style of painting and the abstract school of art he was also part of? Very few, we suspect. So we cannot explain the game's visual appeal by appealing to intertextual references to the codes of abstract art or one of its particular movements. Yet the visual aesthetic of the game is very unusual and very strong. Having played the game in a lecture theatre packed with almost eighty students I can quite confidently say that the game and its visual style, the way this integrates with the music and the integration of all this with the exercise of agency, are quite literally mesmerizing. Although most people have never heard of synesthesia, we would suggest gameplayers intuitively understand some of its basic tenets. The idea for instance that we affect the playable character's movements haptically or that an Xbox game controller signifies a longbow through force feedback vibration and colored pixels but not the feel and weight of wood.

So where else do we look to find the explanation for the pull of the visual aesthetic of Rez? At this stage in our thinking Clive played the game again but this time trying to think what the attractors would be for those who don't know anything about the codes of modern art. One thought that came to mind very quickly was fireworks: vivid explosions of intense color that fade and are gone and are all overlaid on brightly colored wire frame models. When we target and destroy objects in Rez the results look very much like a firework display which, it seemed to me, would be understood by almost everyone.

Rez as a firework display seems a real possibility but does this connect with Kandinsky's visual aesthetic? Not directly; Kandinsky never seems to have mentioned fireworks as an influence despite the fact that he did write extensively about his own personal aesthetics. However, he wanted his painting to express only "inner and essential feelings." He believed that color and shape should be viewed less in the perceptual dimension and in more in their possibility to affect the soul. He stressed the psychological effects of pure color, the way in which "a bright red could affect us like the call of a trumpet," for instance. In other words he was trying to appeal to the interpretive code of visual perception, as Chandler calls it (Chandler, 1994). In other words we have a primitive response to color and shape rather than it representing something else. In this sense Kandinsky has a strong affinity, however unspoken, with fireworks, for his paintings were intended to appeal to us in the same primitive way that fireworks do. I think this is the explanation. Both Rez and Kandinsky's abstract paintings appeal directly to interpretive codes rather than social or textual ones.

Let's reflect a little on Driver and the way semiotics can help us with our analysis of this game. A particular issue we raised at the beginning of Chapter 6 was the role of genre and back-story in forming intentions. We did not actually explain how this worked; we merely observed it in action. Semiotics can help us understand it better. When we watch the opening prerendered scenes that introduce Driver and its back-story we are presented with some narrative fragments, basically film codes, that tell us who we are and what we are going to be doing. We do this by building

connotations over the basic denotations of the scenes. We derive connotations that inform us the character we are to roleplay in this game. The effect of these sequences and the training level that follows is to ground the back story in some specific myths to do with culture in the United States; namely myths to do with the criminal under-world and the U.S. style of policing. We use the term "myth" here because we are presented with a view of U.S. policing and criminality which we are intended to accept as correct or natural. The myths are conjured up indirectly at first by the grubby police chief's office and the casual style of conversation, and the necessity for undercover operations; textual codes from film and TV that we use to connote the myth of U.S. police.

In the training level we are expected to make use of social codes which we apply to derive connotations of the type of person who is checking out our driving. Using these codes we deduce that this person is black and a criminal, although we never actually see him. The voice is a powerful synecdoche, a complex index, which connotes the whole person. When the first level starts we learn very quickly that we are illegally listening into police radio frequencies. We also, pretty quickly, see stereotypical US police cars in black and white: all of which reinforces the natural-ness of the myths we are expected to adopt. We are not expected to question these myths.

The effect of the connotations we form, regarding the nature of the character we are to adopt and the myths we are expected to accept, is to position us, the player, in a particular way in the game world. We come to see lawlessness, at least with respect to the laws of the road, and the police as the enemy as our natural view of the world. This is intended to direct us to the kinds of connotations we should derive from everyday situations on the road: we ignore red lights and which side of the road to drive on, we don't worry about damaging other people's cars or making them crash and maybe injuring those inside. The connotation we have built up is of a criminal mind and this, in turn, directs us to the kinds of intentions we form with respect to situations we encounter on the road. Once again semiotics complements and completes our previous analyses.

There is one more thing to analyze before we start to bring this chapter to a close and this is the relation between the "game world" and the "real world." Many games these days will not be playable, will be devoid of essential meanings, if we do not make the link between the two. Semiotics is the way we explain and under-stand this relationship. In particular it concerns the interplay between the media specific codes, the textual codes, of computer games, and film, arithmetic, and so on, and the social and interpretive codes of real or fictitious worlds. Only a game that is purely symbolic will not require the social codes.

Shenmue is a game that quite beautifully evokes the social world of a Japanese city and its suburbs. The "real world" connoted here is not one that many players of the game would have direct experience with, although they will probably be familiar with it from TV and films. But while the world of Driver is largely signified in terms of streets, buildings, and traffic movements and noises, the world of Shenmue is highly social and employs a whole range of social codes to do with

language and conversation, facial expressions, body language, and so on. Some of these are social codes most people would be familiar with but others are more specifically Japanese. We only know them through intertextual references to other media which have connoted a mythical Japanese culture that we draw on to make sense of the game world of Shenmue. The graphical layout of the city is relatively simple compared with that of Driver but the social space connoted is a highly complex web of groups of people: shopkeepers, neighbors, bartenders and bar customers, sailors, Chinese people, Japanese people, and of course the various criminal underworlds.

Shenmue is predominantly iconic-indexic with the symbolic largely hidden. The result of this is that social and interpretive codes appear to dominate over textual codes although the roles of the latter are very important and will be studied in Chapter 11.

The role of codes of narrative—so important to Shenmue—has become a field of study, virtual or interactive digital storytelling, in its own right; but there is one point to do with filmic codes that we will make now. When discussing Shenmue we suggested that we needed to add an extra generic activity, *movie*, to the others that we had already been working with because of the importance of prescripted action sequences (PSASs) and prerendered cut scenes integrated into the gameplay itself. Making use of film codes in this way is not intertextual in the manner of the exotic fruits in Pac-Man or the style of Blade Runner. In Shenmue we do watch bits of movies almost all the time as part of the gameplay. Shenmue adopts a multitextual approach in addition to its intertextual approach to other aspects of the game. In fact, this is what genre switching is; each of the game genres Shenmue switches between: *adventure*, *beat-'em-up*, *driver*, and *puzzle*—in addition to *movie*—represent related but distinct texts with their own media codes. Shenmue is a fine example of a multitextual game. It seems highly likely that as computer games develop and become more sophisticated—particularly with respect to more advanced storytelling—they will come to rely on the multitextual approach more and more. Later episodes of Resident Evil are further examples.

SUMMARY

In this chapter we have introduced some of the main concepts of semiotics and applied them in some detail to Pac-Man as well as to a range of other games that have also been the object of our analyses. Essentially we have been filling in the gaps that our other analyses were not designed for. Of course not all games have gaps to fill. Tetris for one being a game of agency and presence has no need of social codes, for instance. But it being a digital game, does the player make use of appropriate media codes in order to play it successfully? We are not finished with semiotics yet. In the next chapter we will study interaction from the standpoint of semiotics and show how this incorporates activity profiling, aesthetic theory, and POs and allows us to more completely build a model of what a game is. Essentially we will study media codes appropriate for video games.
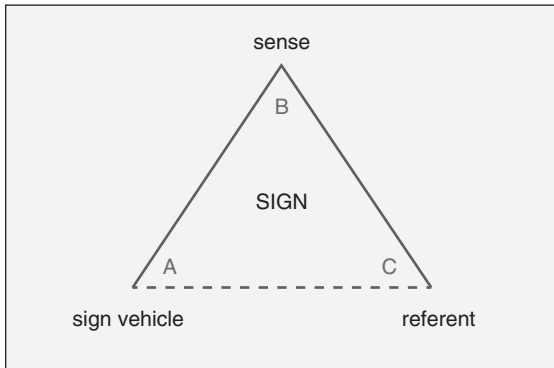
Figure 10.4   Peirce's characterization of the sign. (Courtesy of Daniel Chandler, Aberystwyth University.) (See color insert.)

In winding up this chapter we want to say a few things about the way we have developed semiotics. In order to make the introduction of the subject easier to understand we have simplified and generalized somewhat; so before we point you in the direction of further readings we are going to add a little complexity and specificity. Semiotics was invented separately by the Swiss linguist Ferdinand de Saussure and the American philosopher Charles Sanders Peirce (pronounced "purse") and gave rise to two distinct schools of semiotics which have then gone on to be further developed into more branches and so on. Much of what we have called "semiotics" in this chapter belongs to the Saussurian school, but not all of it. The model of the sign we have adopted, for instance, is Saussurian. The three modes of the sign, symbol, index, and icon, originate from Peirce, who also had a different characterization of the sign itself, as shown in Figure 10.4.

The "sign vehicle" is essentially the signifier of Saussure. The "sense" is very close to Saussure's "signified" although Peirce saw it much more as a mental process than a mental image. The "referent" has no analogue in Saussure's characterization and refers to something in the real world—which could be a fictitious object or person—that anchors the sign to a certain extent. There are situations in which Peirce's characterization is more appropriate than Saussure's; the design of aircraft cockpits and ships' bridges are examples where the real world, in the form of a whole set of referents, directly affects the controls and displays.

The whole philosophy as to what semiotics can and should be has changed over the years. For instance, the approach to semiotic analysis we have adopted here belongs very much to the structuralist tradition in the sense we have taken for granted the idea that we only need to analyze the text, the game in our case, in order to arrive at its meaning. Poststructuralism takes the view that in order to find the meaning of a text we have to consider the people who made and coded it and why they did what they did, as well as considering the people who interpret and decode it—play it, in other words. In this case semiotics can appear to be analogous to anthropology, the study of the behavior of people in the real world. A mix of both approaches would seem to be advantageous but is outside the scope of this book.

FURTHER READING AND TASKS

For further reading to support the ideas introduced in this chapter the best starting place is Chandler (1994) whose approach I have adopted, in a greatly simplified form. The same document gives an excellent introduction to the history of semiotics and its diverse schools of thought. For a more basic but very readable introduction to the subject you could read chapter 9, "Signs of Life," in Poole (2004). Two classic but highly readable introductions to semiotics by two of the founders of modern semiotics are Roland Barthes' *Mythologies* (Barthes, 1987) and Umberto Eco's *A Theory of Semiotics* (Eco, 1979).

This has been quite a long and demanding chapter and you need a task to help you build up your semiotic skills. But you already know what it is, don't you? Of course, you have to do a semiotic analysis of OpenCity. Despite being a lot simpler than the later versions it's still packed with signs and meanings of all sorts. Attempt the kind of analysis for OpenCity that we did for Pac-Man. Of course you won't be able to do a complete analysis of all the signs in the game but see how far you get. One of the reasons for choosing this game is that it is a very measured game in terms of activity. Don't forget to follow the whole process from this chapter through. By which we mean, don't just make a list of individual signs and leave it at that. Think about the types of signs, denotation and connotation, syntagmatic and paradigmatic analyses, codes, intertextual analysis, and so on.

When you're done with all this go back to your analyses from Chapters 8 and 9 and see what the big picture looks like; how does it all fit together? Overall, you should remember that the idea at this stage is to use semiotics to "fill in the gaps" left by our other theories.

Chapter 11

All Work and Play

We've got work to do. Games are about doing work; the work of restructuring the syntagmatic relationships between signs to achieve new relationships, new significations beneficial to the player. Remember, in the last chapter we talked about one of the characterizations of computer games as being the diachronic relationship between syntagmatic relationships. In other words, at any one time we can take a sort of perceptual snapshot of the signs on offer and their meaning. This meaning suggests to the player, connotes, a different relationship that he/she desires and tries to achieve, or fears and tries to prevent. In turn this results in the construction of a different relationship out of the many that were possible, one that may or may not resemble the one desired or feared. Playing a game is therefore about constructing a particular diachronic ordering over syntagms; again, one out of all those possible. Computer games are one example of a very particular type of texts in which we know we have to work to find meaning.

Remember, in Chapter 4 we talked about agency as being concerned with intention and perceivable consequence and in Chapters 7 and 8 we talked about perceptual opportunities and, in particular, attractors and rewards as a mechanism for relating them. Well, the semiotic relationships in the paragraph above offer us a theoretical basis for considering agency in a more rigorous manner. Essentially, all the theories we have considered in earlier chapter were semiotic theories; read on.

In this chapter we will start by examining the nature of the work we have to do in order to find the meanings we need in order to play games. We will then go on to look more specifically at signs that signify interaction and how they do this and the nature of such significations. The object of the chapter is to characterize "the work of meaning" and where the player fits into this. In the next and final chapter we will attempt to put together a semiotic model of the whole meaning of a game. Part of this semiotic model will be the "Code of Interaction," the underlying rules that game players use to find meanings in games and thus to be able to play them at all. In the final chapter we will also attempt to answer the question of "What is a game?"

THE WORK OF MEANING

We are so used to reading books and magazines that we usually do not give any thought to the kind of effort we have to expend to make the process of signification possible. In reading a novel we have to scan the lines of text left to right and top to bottom and then move to the page on the right or turn the page and repeat this process. All this just to uncover the presence of signifiers (symbols in this case) that we still have to construct significations for. The scanning of pages would of course be different if we were reading in Arabic or Chinese, for instance, but the process of meaning making would be very much the same and the lack of conscious attention given to the work of reading just the same. Of course, this is only the beginning of the meaning-making process that constitutes reading a novel.

For some types of communication media this work is more important than in others. Some media such as feature films do not appear to require any more work than the exercise of concentration. However, we have to decode films just as we do any other text and we are able to do so because we have become adept at recognizing and interpreting the codes around which films are constructed. The Hollywood feature film is at once so highly stylized and yet so embedded in our cultural experience—if you are a westerner, that is—that it is easy to think that we are being presented with something natural, a simulation of reality even. In this sense the Hollywood style of filmic storytelling is a myth; something so seemingly natural we do not question it. Yet there are many other film traditions around the world which seem equally natural to their intended audiences; Bollywood is a good example. The apparent naturalness of the various filmic traditions of the world—for their intended audiences—mask the amount of work people have to do to make a coherent set of meanings, a story, out of them. Even in watching a film we are working; we are doing the work of meaning. Watching *Memento*, for instance, requires considerable effort if you are to make sense of it.

In playing computer games we appear to be doing a lot more work. What is the work of Pac-Man for instance? In the first instance, when the game starts, I assess where Pac-Man is and where the ghosts are. At this stage the ghosts will be few and far away. There are various directions I can send Pac-Man in to get him started eating; lines of food are the initial attractors. I choose one and form an intention to get Pac-Man to move off down a corridor. The perceivable consequence is that Pac-Man does as he is told. The reward is that he starts to accumulate points. I might form the intention to direct Pac-Man to one of the four food items that signify a power-up. I might have to form an alternative intention to avoid the ghosts that are approaching, to make sure that I do not get Pac-Man into a situation where he will be trapped and lose a life. My intentions must be flexible. I have to be very careful where I send Pac-Man.

I have skipped over something here! I've mentioned attractors and rewards, intentions and perceivable consequences, but these all make up signs—how, we'll see in a few pages time—the game engine offers me to interpret. I've glossed over the fact of my being able to "send Pac-Man off" in various directions. I have not talked about this or how our theories might help explain what is going on here.

Pac-Man used a simple set of controls: in the original arcade game and the various game console versions that came out later, the game used four arrow keys, pointing up, down, left, and right. Associated with these arrow keys were four commands, to go up, down, left, and right on the game board; or north, south, east and west if we think of the game's visual display as a "top-down" view of the game world. So the signs that make up the controls have a denotation to do with the way they appear on the console and they also have a symbolic meaning to do with the effect they can have on Pac-Man when pressed. In fact, there is more; the arrow keys signify the following:

- Four red arrow buttons pointing out from a central point, denotation.
- The potential to command Pac-Man to move north, south, east, or west; up, down, left, or right: the connotations of the buttons and the intentions these connotations suggest.
- Issuing the command to make Pac-Man move north, south, east, or west when the buttons are pressed: working to turn an intention into a perceivable consequence.

Notice that although these arrow keys can be perceived, can signify visually, we do not in fact respond to them in this way when we are playing the game. They are haptic signifiers that are both tactile and proprioceptive. Tactile simply refers to our sense of touch, which breaks down into two types of sensation:

- The surface properties of things: Rough, smooth, cold, warm, patterned, etc.
- Forces acting on our body through objects themselves subject to forces: For example, a ball that we catch, a chair we bump into, the chair that we are sitting on.

Proprioception is our sense of where our limbs, fingers, knees, ears, and other bits and pieces are, even when we cannot see them. Proprioception is the means by which we feel for a light switch in a darkened room that we are familiar with; we cannot see our hand or the fingers that are part of it but we sense exactly where they are in relation to the rest of our body.

We normally think of games as being mostly about sound and vision, with just a few games such as Rez and those that can make use of force feedback joysticks, for instance, employing haptics. However, most games employ haptic signifiers to allow us to issue commands to the game engine.

There are thus two distinct functions which signs have in computer games:

- Those that signify the current game state
- Those that signify the physical means of intervention.

It makes sense to allocate differing sensory modalities to the two: sound and vision to signify game state, and haptics to signify intervention. That way it is a lot easier to keep the two types of work separate.

If you ever played one of the early, web-based versions of Pac-Man, programmed as a Java applet, where you had to use the mouse to click on the arrow

keys which are in fact implemented as buttons within the applet you'll know exactly what I mean. Instead of employing tactility and proprioception to issue the four basic commands you constantly have to look at the arrow keys (buttons) and the cursor and in doing so look away from the game space itself. The game gets a lot more difficult. Many web-based versions of Breakout suffer from a similar problem.

Many games, though not all, employ this sensory split to distinguish the signs of the game state from the "signs of intervention"—the input devices and what they mean to us. In *RTS* games, which are less twitchy and more measured, we can successfully make use of a mouse, cursor, and buttons to be clicked as signs of intervention in order to command NPCs, order things to be built, and so on. Force feedback joysticks are interesting because there is actually a split between passive haptics—the feel of buttons and so on—and active haptics—vibrations that signify forces acting on the player—and so there is still a subtle but clear split between signs associated with the game state and those associated with intervention.

Pac-Man appears to be a sign we can handle but we can only handle him indirectly, we cannot touch him. In actual point we can touch him—on the screen—but he will not be aware of our touching him or respond to our touches. We have to handle him indirectly through the signs of intervention. One of the great pleasures of games is the sense of agency we are offered. In effect, this means we are offered the ability to reconfigure certain signs in a limited number of ways; these signs in turn may cause reconfigurations in other signs.

The ability to intervene, to be able to reconfigure signs, constitutes the basis of the pleasure we gain from playing games; agency, in a word. Intervention signs are principally conventions, they are symbols; we have to learn them anew for each new game. As with all consoles, the Dreamcast uses the same game controller for Shenmue, Rez, and many, many more games. Shenmue uses several sets of conventions, one for each of the genres the game is liable to switch to. The highly symbolic nature of intervention signs seems not to bother players, whereas the signification of the game world and the current game state seems to need to be iconic–indexic to a large extent for more and more games. At the end of this chapter we will consider some later signs of intervention technologies that are not so symbolic, Wii and Kinect for example, where the sensory split is not so clear cut.

The result of this sensory split is that, for very many games, the audio–visual modes denote the past and connote possible futures while the haptic mode denotes the particular interventions we can make moment by moment and, importantly, connotes the means of achieving the possible futures connoted to us through the audio–visual senses. It is rare of course that invoking intervention signs leads directly to a game future that we desire. The pleasure of agency is that we have to plan and act on those plans in the hope getting what we want.

It is tempting to think that agency therefore breaks down into a simple cycle in which the game engine signifies the game state to us and we in turn signify intention through particular interventions to the game engine. It does not usually work that way, however. The computer usually doesn't stop and wait for our next intervention; it keeps going, even in most overtly turn based games. Of course, there are examples where everything stops until the player makes their required intervention.

For another thing, we cannot signify to the computer, it doesn't do semiotics. Or rather, it doesn't reason in any way that could be analyzed using semiotics. Computers compute, algorithmically. We do not signify to the game engine in the hope that it will make the kinds of meanings we wish it to. We issue a command to the engine to move Pac-Man this way or that and the engine responds by doing what we ask, if it can, or not, if it can't. Pac-Man will only keep moving in a certain direction until he encounters a wall then he will stop until we issue a command that moves him in a different direction along a corridor.

Such commands are essentially nonsemiotic in the sense that not only is the game engine's response algorithmic but the immediate outcome of our command, our button press, is an electronic communication—not a signification—between the interface peripheral and the game engine. Trondstad (2001) discusses the relationship between semiotic and nonsemiotic acts in the particular context of *MUDs* and goes on to suggest that the interplay between the semiotic and the nonsemiotic is fundamental to interactive digital experience. We try to reconfigure the signs in a game—so as to be able to construct desirable significations —by means of nonsemiotic acts which intervene in the running of the game engine.

Follow the first link for Spacewar in the List of Games at the back of this book and you'll find a photo of two people playing the game in 1962: the year it first ran on a PDP-1 at MIT. On the right you will see the circular display, while on the left you will see two (suited) players with the game switches in their hands. Apart from the suits, the scene is so recognizably "people playing a computer game" that it's almost uncanny considering there was no computer game culture at the time. What's also uncanny is the apparent unconcern in the games world for really understanding what is going on here. Read on!

SIGNS OF INTERACTION

Let's look at the relationship between the signs of intervention and the signs of interaction that games engines offer us. By "signs of interaction" I mean the specific signs in the audio–visual game world that we seem to be able to affect by means of the signs of intervention together with all those signs that we can indirectly affect and those that might be able to affect us. Essentially, this is what POs and agency talk about. In Pac-Man this might appear relatively straightforward: we have four signs of intervention and they are all directed at Pac-Man himself. A typical interaction sequence (IS) in Pac-Man would be:

1. We select an **attractor**, a group of uneaten "food" dots.
2. We form an **intention** to eat the group of dots.
3. Keeping the **attractor in view** and thus the **intention in mind**, we issue commands to Pac-Man—we **make nonsemiotic acts** via the signs of intervention—to move him towards the food. We monitor the **perceivable consequences** until **a reward** on offer **enables our intention**. This might involve several changes of direction to get him to where the food is.

4. When the **intention is enabled** we might have to issue more commands to move Pac-Man around so he can eat. Eventually **a reward** on offer **matches the original intention**, the food has been eaten.

5. On to the **next attractor.**

That is actually pretty complicated even for such a simple set of intervention signs offered by Pac-Man's game engine. Is it always that way?

In Chapter 9 we documented a typical IS from Shenmue. Let's look at it again, but in a little more detail and with the nonsemiotic acts added:

1. We select an **attractor**, a door for instance, among those on offer within the field of view.

2. We form an **intention** to "find out what is behind the door." (I'm assuming in this case that we don't already know.)

3. Keeping the door, the **attractor, in view** and thus our **intention in mind**, we issue commands, **make nonsemiotic acts** via the signs of intervention and monitor their **perceivable consequences** until **a reward** on offer **enables the intention**. In other words, we move Ryo toward the door.

4. As we come within close proximity to the door, the icon representing the red A button on the controller appears close to or over the door; our **intention** is enabled.

5. We press the actual red A button on the hand controller.

6. The game engine instigates a PSAS of Ryo positioning himself in front of the door, turning the door handle and opening the door, walking through the door, and then closing it behind him—the **perceivable consequence**.

7. The game engine then loads the files that represent whatever is on the other side of the door, our **reward** is a whole set of **new attractors** which **match our original intention**. We have found out what was on the other side of the door.

There are more steps in the Shenmue sequence but it looks pretty similar to Pac-Man, doesn't it? Both Step 3s are remarkably similar in that the sequences of perceivable consequences signify "walking" to where the intention can be enabled. Of course such significations run parallel to the nonsemiotic efforts of the computer and the perceivable consequences themselves are quite different. Pac-Man signifies walking symbolically by gliding rather elegantly along, he doesn't do it iconically as Ryo does. Roland Barthes calls this identification and naming of activities the proairetic code (Barthes, 1990).

But isn't Shenmue a modern, complicated game? Isn't there a lot more going on? The real difference is to do with what happens when the intention is enabled. In Pac-Man the intention is enabled by simply getting Pac-Man in the right place and going in the right direction. In Shenmue, getting in the right place only allows us to try and open the door. We do indeed have more to do because at any one time

most of the game world is hidden from us. But, importantly, the two ISs are very similar. We can generalize them, and we can define a generalized interaction sequence (GIS) for all games:

1. Identify the next **attractor**: either wait for it to become apparent or select one on offer.
2. Form an **intention** with respect to the attractor.
3. **Attractor in view** + **intention in mind** means:
   a. make one or more **interventions,**
   b. monitor **perceivable consequences, and**
   c. keep doing this until **a reward** on offer either:
      i. appears to **enable the intention**, go to 4.
      ii. appears to **match the intention**, go to 1.
4. Make interventions until **a reward** on offer **matches the intention.**

The nature of attractors and intentions and the relationship between them varies from game to game and within the same game. The differences between the GIS and the two ISs above reflects this. With games like Tetris and Breakout we do not have to search for an attractor or choose between competing attractors; the next attractor is simply presented to us. In Tetris we have to formulate an intention which makes best use of or does the least amount of damage with the group of blocks that appear. In Breakout, the intention is always the same—hit the ball back upscreen—but we have to work out where it's going to take place—where we have to match the intention—and we can't be sure of that until the ball rebounds off the wall at the top of the screen. In both games, the intention can be matched directly; it does not have to be enabled as in Pac-Man or Shenmue. Hence the divergence in 3c in the GIS above. In *RPGs*, for instance, the intention we form in response to a particular attractor might relate to something not in view and not even known to us. We will need to enable the intention before we can match it. We have already discussed this in terms of myth and back-story earlier in the book.

Shenmue is more complicated than Pac-Man for other reasons. We can still only handle one sign, Ryo, but we have a lot more control over him. This is because there are more signs of intervention than in Pac-Man. In Shenmue all the signs of intervention are sited on the standard Dreamcast game pad, where for the main adventure gameplay we have:

- The arrow keys, which signify commands to move Ryo around
- The twitch stick, which can also control his movements
- The A (red), X (yellow), Y (green), and B (blue) buttons, which signify other types of interaction such as saving the game and calling up the inventory and notebook
- The two finger switches underneath the controller which signify the command for Ryo to look at or examine objects.

As we saw in Chapter 9, most of the time we perceive these haptically, but they are often also represented iconically in the game world. The red A is regularly used to signify the possibility for interaction—with people and doors, for instance—and all the four colored buttons are represented iconically in the quick time events.

There are then a large number of signs that Ryo can affect:

- The various doors
- Furniture such as cupboards and chests of drawers
- Objects we find in drawers and on shelves in shops
- The inventory of objects we have collected
- The actual objects we have collected
- The notebook
- The actual view we have into the game world
- And more.

There are also signs that can affect Ryo: the characters he fights, the people who give him information, and so on. There are yet other signs that affect Ryo in a less dramatic way: walls, roads, sidewalks, lampposts, and other street furniture all conspire to constrain his movements. Some signs are neither affected by Ryo nor can he affect them; shop signs and advertisements on shop windows, the packaging of items to be found in the convenience store, and so on. We the player are affected semiotically, but the playable character is not. There also might be other types of signs that we have not noticed yet. We need a theory that allows us to characterize the signs of interaction and the signs of intervention more rigorously, in a more fundamental way. We could use POs, as these can be used to analyze individual signs as well as groups of signs, but there is a ready-made theory we can put to use.

THE MECHANICS OF INTERACTION

Peter Bogh Andersen is a semiotician who first put forward his theory of computer-based signs (CBS) over ten years ago (Andersen, 1997). CBS specifically address the characterization of individual signs—in interactive media in general and games in particular—from the point of view of what they contribute to agency. We will see later that CBS and POs complement each other quite nicely.

Before going any further, we should point out that CBS are used in a particular and focused way in this book to support the general theoretical model being developed. Andersen (1997) should be consulted for the full and intended theory of CBS theory and its in-depth application. In particular, signs of intervention are not part of CBS but have been added by the authors.

The basic approach taken by CBS is to identify just four characteristics of signs with respect to interaction and then to use these to build up profiles of a range of signs. The four characteristics are:

- Permanence: A sign that can be recognized throughout its existence.
- Transience: A sign that can change its appearance, its signifier, in some way while still having the same signified.
- Handling: A sign that can be controlled directly by the player through the signs of intervention: keyboard, mouse, joystick, etc.
- Action: A sign that can cause changes to other signs.

To get some idea as to what we mean by these four characteristics, let's quickly run through some of the signs in Pac-Man:

- The layout of walls and corridors are made up of signs that possess permanence; they do not change and we always recognize them.
- The ghosts possess transience; we know the ghosts are made up of five different signifiers, only one of which is perceivable at any one time, yet we still recognize individual ghosts.
- Pac-Man himself possesses handling; he is the only sign we can directly affect.
- Pac-Man and the ghosts possess action; they are able to affect other signs in the game: Pac-Man and the ghosts can be killed, the food and exotic fruit eaten causing changes in the score, etc.

In this book we take transience to be more than just a flickering light or revolving advertisement which has no causal relationship with any other sign. Such signs would be layout signs, as you can see in Table 11.1. The point about CBS is that not all signs possess all these characteristics and that all signs in a game fall into a small set of classes according to those they do possess. The table shows this quite clearly and simply.

We can see from the classification in the table that we arrive at six classes of interactive sign. The interactive sign possesses all the characteristics and identifies signs we use to intervene in the game. Actor signs possess all characteristics except handling; they represent NPCs, doors and other autonomous and semiautonomous game signs which can change other signs and be changed themselves. Controller signs only have permanence and action; they are characteristic of such things as

Table 11.1 Classes of Computer-Based Signs

Class	Permanence	Transience	Handling	Action
Interactive	*	*	*	*
Actor	*	*		*
Controller	*			*
Object	*	*		
Layout	*			
Ghost				*

Table 11.2 Computer-Based Signs in Breakout

Sign	Class	P	T	H	A
Paddle	Interactive	*	*	*	*
Ball	Actor	*	*		*
Brick	Actor	*	*		*
Wall	Actor	*	*		*
Screen boundary, left and right	Ghost				*
Screen boundary, top	Ghost				*
Screen boundary, bottom	Ghost				*
Score	Object	*	*		
Balls left	Object	*	*		
Beep when ball rebounds	Object	*	*		

walls, floors, and other signs that constrain movement, for instance, but do not change their appearance or respond to other signs. Objects are permanent and transient but do not affect other signs; signs of health and wealth, the pedestrians in Driver are typical objects in CBS. Layout signs are there to signify the context of the game world but do not change and do not contribute to gameplay causally.

The ghost sign only possesses action, as it cannot be seen and therefore cannot change, and cannot be handled but it does affect other signs; it does not seem to make sense and appears to break the first rule of semiotics: all signs have to have a signifier. We'll talk about ghost signs more later.

Let's see how CBS work by applying them to that early classic Breakout. If you have never played Breakout follow the links at the back of the book to get an idea of what this simple but compelling game is all about. The aim of the game, of course, is to move the little blue "paddle" at the bottom of the screen left and right in order to deflect the white "ball" back towards the colored "wall" at the top of the screen. You win the game when the ball hits the top of the screen. Table 11.2 gives a CBS characterization of all the signs in the game.

Not surprisingly, we have an interactive sign, the paddle, which we can handle via the signs of intervention—buttons in the original arcade version, to move the paddle left or right. The paddle affects the ball by deflecting it if we get it to the right place at the right time. There are actor signs: the ball, which affects bricks by removing them; bricks, which deflect the ball when they are hit; the wall (a syntagmatic arrangement of bricks) itself, which allows the ball through if enough bricks have been destroyed. Next we come to three ghost signs; but why ghost signs? Well, in the original arcade version there were no signs for the edges of the game's display. The balls appeared to hit nothing on the left and right but were still deflected. A ball disappears and we lose the game if it hits the bottom of the screen and disappears and we win if it hits the top of the screen. These are good examples of ghost signs; we only become aware of their presence by exercising agency, by making the ball

bounce back off the paddle. Ghost signs are specific to games and computer-based, interactive media.

It is possible to argue that these three ghost signs should really be controller signs as the game designers have used the edges of the screen in its own right as a signifier. In this case these three signs would be both permanent and active. In other early games the screen boundaries had different actions associated with them; in the case of Spacewar reaching the screen boundary with your space craft resulted in you being "teleported" to the opposite side of the screen. Whether or not we regard the screen boundaries here as ghosts or controllers, there are numerous examples of ghost signs in other computer games. The important insight here is that in games we can find meaning through exercising agency, through intervening.

Finally, in Breakout we have three object signs: "score," "balls left," and the beeping noise as the ball rebounds. These are permanent, we always recognize what they are; and they are transient, the score goes up, the "balls left" goes down, and the beep signifies the ball colliding with an object. They do not affect other signs but they can be affected by other signs: specifically, the syntagmatic relationships between certain other signs cause them to change.

Certain syntagmatic relationships between signs signify not only change but also major gameplay developments. The sign composed of a ball immediately against the bottom screen boundary causes the "balls left" sign to decrement—you lose a life and possibly the game itself. A ball hitting a brick causes the score to increment, the brick to disappear, and the ball to be deflected. In all these, and other, situations we have the collision between an actor sign and an active sign, or between two actor signs, or between a controller sign and an interactive or actor sign—the ball and a brick for example—triggering changes to various transient signs: the ball rebounds, the brick disappears, the object signs for score and "balls left" are adjusted. We could refer to the latter two changes as "side effects" because they are the result of the internal gameplay logic rather than anything we can perceive directly on the screen. They reflect that logic in operation symbolically in the perceivable gamespace.

Thus particular syntagmatic relationships between action signs cause significant changes in game state, the nature of which are often signified through object signs. Figure 11.1 details the patterns of relationships between signs. In general we can say this about the various classes of signs:

- Interactive: Literally the target for our interventions, in turn can affect actor signs and object signs.
- Actor: Autonomous agents, NPCs, in the game world, can affect interactive signs, object signs, and other actor signs.
- Controller/Ghost: Constrains the behavior of interactive and actor signs.
- Object: Reflects changes in the game state; the white arrow indicates the possible presence of side effects.
- Layout: Does not participate in gameplay but helps to denote and connote situation and context.
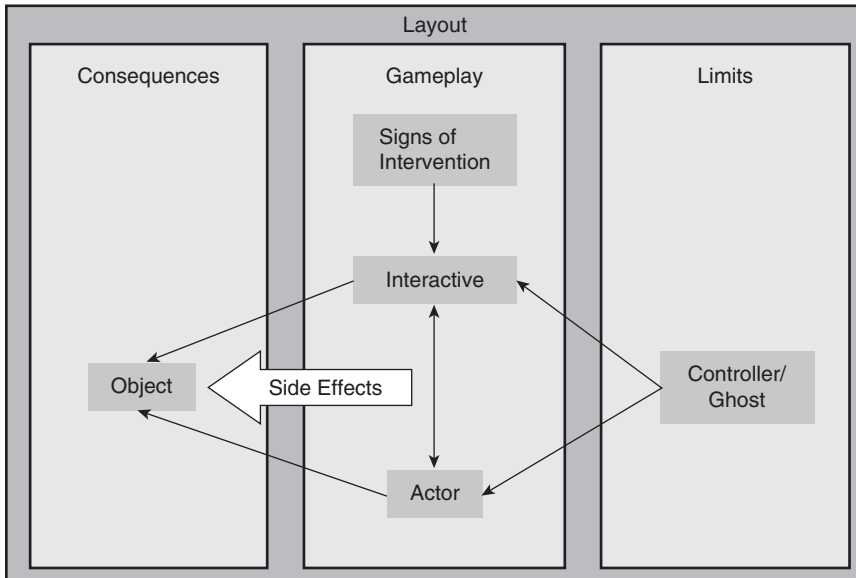
Figure 11.1   Relationships between computer-based signs. (See color insert.)

There is a general pattern to all this which the diagram tries to make clear. This is a characterization of the "mechanics of interaction"; the general causal relationships between signs irrespective of what they might signify. At this level no distinction is made between Pac-Man and Ryo Hazuki, between the tumbling blocks of Tetris or the getaway car you drive in Driver; they are all interactive signs. That distinction is made in other levels of the meaning-making process. We see that the diagram is divided up into four zones. The whole background is the domain of the layout sign which takes no part in interaction but where those other levels of meaning are to be found. The right hand zone belongs to the controller and ghost signs which in general establish limits on the gamespace. The central zone belongs to the signs of intervention, the interactive sign and the actor sign, and is where the principal gameplay takes place. The left hand zone belongs to the object sign and is where other consequences of gameplay are made known: the sounds of walking, eating, and gun fire; displaying frags, lives, and other side effects such as health and damage.

We believe game players have this low level model of gameplay in their minds and build it up as they play games and use it to play new games. Not that they know about CBS necessarily. CBS, as used here, are a theory of game play and the diagram is a model that attempts to make the mechanics of this model clearer. Game players build up their own version of this model in some nonverbal, unconscious level of their minds. We believe this is the foundation of game play. Some games, of course, Tetris in particular, don't have all that much more to them than this bare-bones mechanics and are certainly not lesser games because of it.

However, even a game as apparently simple as Breakout can denote and connote game context. In Breakout's case we have probably the world's simplest back-story; literally the name of the game. We have to break out through the wall denoted by the arrangement of bricks. The prison is connoted by the wall, a synecdoche, the part for the whole, the wall for the whole prison. There are no layout signs in Breakout to help in this connotation but they probably are not needed. The simple signs and the nature of the agency on offer suffice.

Platform games often used layout signs to enhance the game's context. Dark Castle is a classic platform game released in 1986. Typical of platform games, Dark Castle uses layout signs extensively as backdrops to the main action. Such layout signs add an enormous amount of atmosphere to the game by setting levels in caves, forests, and so on. Of course, such layout signs play no role in the gameplay. All the other signs, the stalactites, the moving platforms, rocks that can be thrown, bats, and so on, that are part of Dark Castle are examples of one or other of the other five classes of CBS.

Incidentally, Dark Castle has a classic ghost sign. At one point you are walking through a cave when you simply fall though the ground beneath your feet and lose a life. There is no way of knowing the presence of this hazard the first time through but you quickly learn to recognize where it is. It is apparently a sign with no signifier that you learn the meaning of through exercising agency. However, another way of looking at it is that the hero falling through the floor is a signifier signifying the loss of a life. The trap door itself is a connotation; if we have fallen through the floor there must have been a hole in the floor, a trap door that we cannot see. The ghost sign uses the act of agency to transform a signifier into a signified, a connotation of an object we cannot actually see. There is nothing unsemiotic about this, it's just an enabling feature of interactive media.

What is the interactive sign in Shenmue? Ryo, of course. We can tell Ryo where we want him to go and what we want him to do, but the interactive sign in Shenmue is not the playable character, merely an aspect of it. Remember the section "Making Up Pac-Man" from the last chapter. Ryo has a rudimentary personality that constrains what the player would like him to do in certain circumstances. There are his martial arts skills, which are developed as the game progresses. There is his voice and questions he asks people. There is his relationship with Nazumi. There is a whole range of objects, such as the inventory of Ryo's possessions that he carries around with him and the notebook that gets added to as we progress through the game (but which we cannot ourselves write in). Ryo is a complex character.

There is also a whole host of actor signs, the eighty or so NPCs. Controller signs are represented by buildings, streets, street furniture and, it being Japan, by tissue paper walls that are just as substantial as concrete. Because so many objects are rendered in 3D there is very little use of layout signs in a modern *action adventure* such as Shenmue.

In the way we are using them, CBS operate at a level quite close to implementation; they give a strongly functional view of the interactive meanings of individual signs in computer games. Signs can be classified using CBS in terms of their contribution to gameplay and, as we have seen, the syntagmatic relationships between

signs which can affect or be affected by others constitute the major events in the gameplay. One of the nice things about CBS is that they allow us to incorporate the signs of intervention, of the physical interface, quite readily into the model. Figure 11.1 illustrates this and shows the nature of the nonsemiotic act of command, the intervention.

But let us emphasize the fact that the act of pushing a button, to change Pac-Man's direction for instance, is nonsemiotic as far as the console/PC is concerned does not mean it is devoid of meaning to us the player. To us the button signifies the possibility to interact, it signifies direction, and pushing it signifies directing Pac-Man.

CBS, as we have used them, talk only of the mechanics of interaction, in the sense that they don't differentiate between a blue rectangle representing the paddle in Breakout, a group of blocks to be spun and moved in Tetris, and a detailed 3D avatar with a wide range of movements (e.g., Ryo in Shanmue). They are all interactive signs according to CBS. Underpinning all games is a simple mechanic that is captured by CBS, and that is strength.

We have a range of theories to take care of more complex layers of meaning-making and, as we have already noted, even very simple games can have meanings that conjure up associations with the world outside the game world. In the next chapter we'll show how all the theories in this book interrelate and work together. But we still have more to gain from studying and using CBS.

THE INSIDE-OUT CODE

In this chapter we have considered games in terms of the work of meaning—pressing buttons, working joysticks, and moving mice—in conjunction with the process of meaning making itself. We have seen how the signs of intervention integrate with CBS and how this low level of viewing games integrates with higher-level views via GISs. Let's look again at the work of meaning because there are other aspects to do with gameplay that the game engine attempts to signify to us which are quite fundamental. The "side effects" in Figure 11.1 are a clue to this because they represent the game engine, often via the HUD, trying to give us information necessary to the gameplay that is not accessible through the main gamespace: the number of lives remaining in a Pac-Man level is a good example. Let's think about this some more.

The heart of any computer game is the game engine and its associated data. The game engine of a modern computer game is a very large and highly complex piece of software consisting of hundreds of megabytes of code written in a high level, perhaps object oriented, programming language. By contrast, early classic games were very often only a few thousand bytes of code written directly in assembler. But in this case, size really doesn't matter when we ask the following question: how much of the game engine's actual functioning does the player need to understand?

The vast majority of players are not programmers; they would not be able to make any sense at all of the game engine's source code, its algorithmic structures, the interdependency of its subroutines, the data it stores and how it stores it, the

relationship between code and hardware, nor the functioning of the hardware. Yet somehow, players come to know something of all these, including:

- The signs of intervention and how they can be used to affect the game state;
- The internal economy of the game, the values associated with resources at the players disposal or threats to the player's continued success; and
- The logic, the rules of the game, and how the game engine affects the game's internal economy.

It is certain that players build up abstract models of how games work and use these to build up customized models for particular games. It is also certain that the genres we find in the press and in discussions of games in general are a vain and clumsy attempt to describe in words the very subtle and powerful nonverbal abstractions that our brains construct and employ so effortlessly and unconsciously when we play games.

Computer games are superficial in the extreme! That is one of their great strengths. We come to recognize the appearance of cities and landscapes, the appearance of people, creatures, and alien life forms. We recognize the appearance of behavior and intelligence, weather, health, wealth, and food. But they are all just that: appearances. And one of these appearances, perhaps the most important of all, is the glimpses of the game engine's logic and the internal economy it manages. A good game signifies an appearance of its own internal workings, it "superficializes" itself in the name of gameplay. We will call this aspect of a game the "inside-out code" for obvious reasons. It is a media code of games and some other forms of interactive entertainment.

Without an understanding of its inside-out code, any game is going to be very difficult to learn and to play. Such difficulties would seriously detract from the aesthetic pleasures of the game. But a game must nonetheless signify as much of its internal working as necessary to allow players to make choices between competing attractors, form intentions, and assess perceivable consequences. Sometimes there is almost nothing to hide: Tetris is a good example. Sometimes much has to be hidden or made less than clear to make the game playable. To succeed at SimCity a player has to use the inside-out code to gain some understanding of the algorithms the game uses to determine if your city is growing or shrinking, prospering or failing. If the player were given comprehensive descriptions of these algorithms, the game might not be worth playing at all.

Players work all the time with the inside-out code; it's a natural and necessary part of gameplay. Players have a surprisingly intimate relationship with their game's software. And remember, one way to start to make sense of the inside-out code for a particular game is to take notice of the way object signs change as a result of side effects caused by actor signs or the interactive signs affecting changes in other signs. Of course, there will be other causes, the passage of time for instance, but this is a starting point. We are learning by building an internal mind-map of the algorithms within the game. So in fact the game is teaching us the rules as we play. We are learning by building an internal map of the algorithms within the game.

WHERE IS THE PLAYER?

This chapter is very much about the relationship between the player and the game and the work the player has to do to affect change in the game. So far we have not considered the actual nature of the signs of intervention, the interface technologies. We have in fact assumed a typical console or PC interface that consists of:

- A player sitting/standing outside the game and holding its enabling technologies in his/her hands
- Some device or devices: Control pad, mouse, keyboard, joy stick, etc., that turns button presses and the like into electrical signals
- These signals are then conveyed to the console or PC and translated into changes in the interactive sign.

Think back to that photo of people playing Spacewar in 1962: the first link under Spacewar in the List of Games at the back of this book. CBS cope very well with this scenario, but it isn't the only one. In fact, the games industry is in a phase of great change set off in many respects by the release of the Nintendo Wii in 2006. So, when we asked the question "Where is the player?" what we actually meant was "Where is the player with respect to the game and the gameplay technology?" Other gameplay technologies have appeared since the release of the Wii, Microsoft's Kinect is only one example, and they are making this question even more pertinent. Using CBS we can gain some insight into what's going on here.

In Table 11.3 we see a number of game technologies represented in column one. Some will be familiar, some won't. We will introduce them briefly before discussing the rest of the table and its significance.

We can't imagine that anyone reading this book hasn't heard of and most probably played games on the Wii. Basically, the Wii interface augments the traditional game controller with an accelerometer and infrared tracking technologies to allow players to mix in far more intuitive body actions with traditional button presses and so on. The Wii sparked a revolution in the games world that brought in a far wider player demographic and established commercial potential for casual games. Other

Table 11.3   Where Is the Player?

Game Technology	Outside Game	Signs of Intervention	Interactive Sign
Traditional console/ PC	Player	Button, keyboard, joystick, etc.	Avatar, car/vehicle, other
Wii Tennis	Player	Wii Remote and Nunchuck	Avatar, car/vehicle, other
Great Street Games		Player	Avatar, car/vehicle, other
Kinect Joy Ride		Player	Avatar, car/vehicle, other
DS Brain Training			Player
Kinect Quiz Game			Player

companies, big and small, are seeking to drive this revolution forward and gain a slice of the new interactive pie for themselves.

Great Street Games is a U.K. company that uses heat sensing technologies and large scale image projections to create compelling multiplayer games that can be played outside and do not require players to hold or otherwise knowingly interact with any interface technology. Basically an overhead projection system projects simple geometric imagery down onto a public space and the heat sensing technologies identify people and their proximity to certain projected graphics. By stepping onto certain shapes players can take control of them and then interact with various actor signs and so on. In this way people and graphics are associated and players can interact in a very intuitive manner.

Microsoft's Kinect, known as Natal in development, has attracted a lot of attention because it appeared to take the interface technology away from the player altogether. Using real-time infra-red, image recognition, AI, and other innovative technologies, Kinect can identify and track a number of players through their body gestures and thus drive gameplay. Like Great Street Games' technology, Kinect users do not touch, hold, or wear any interface technology of any sort and don't have to know how it works. In the development phase a range of games were hyped/hypothesized among which were a driving game and a quiz game. Kinect Joy Ride is a commercial example of the former. The quiz game has not had a commercial release yet. Basically there was no interactive sign: players' voices and body gestures placed them physically inside the game answering questions in teams.

Most readers of this book will be aware of the DS Lite in its various incarnations and the fact that it augments the traditional hand-held with a touch screen and limited voice recognition. Later versions include a camera and other technologies.

These are the gameplay technologies represented in column one of Table 11.3. Using CBS we can quickly gain some insights into the similarities and differences between these technologies and indeed how traditional or revolutionary they really are. As we discussed earlier, the traditional console/PC platform places the player outside the game in direct contact with some interface technology that connects with a console/PC which interfaces that technology to the game engine as represented in row two of the table.

Interestingly, and perhaps surprisingly, the Wii has the same profile as the traditional console/PC. By augmenting the traditional interface technology, Nintendo has allowed players to incorporate far more intuitive actions alongside traditional button presses and the like. One result, of course, is a huge commercial success. Another, perhaps unexpected, result was that many hardcore gamers came to dislike the new style of gameplay which is far more accessible to the casual player.

With Great Street Games and Kinect Joy Ride, the profile has now changed. These technologies draw players further into the gamespace by making the players themselves the sign of intervention. Both technologies represented here use infrared and heat sensing technologies to identify the location and movement of players and associate an interactive sign within the gamespace with them. As the player moves so the interactive sign moves appropriately. In Kinect Joy Ride the player makes steering and gear change movements which are picked up by the image sensing

technology and are translated into appropriate movements of a steering wheel rendered in the gamespace, in turn changing the speed and direction of the racing car. The effect is that the player is in a real sense in the game.

In the final two rows this process is taken one stage further. In these two games the player is not only the sign of intervention but also the interactive sign itself. In Brain Training the player talks to or touches the DS Lite screen and objects and relationships are changed appropriately: there is no interactive sign, no playable character. In Kinect's proposed quiz game two families sit around on the sofas in their own homes and answer questions put to them by a virtual game host. They are, quite literally, inside the game.

CBS have enabled us to identify a definite shift in the relationship between the player, the interface technology, and the game. At first glance this might seem a natural, almost inevitable progression of development. But is it? Is the gameplay situation of rows five and six better than rows three and four; and are they all better than rows one and two? People have been quick to point out that such basic actions as walking and running and going up stairs are going to be problematic for the types of technology represented in rows three, four, five, and six. Players will have to adopt walking or running on the spot actions instead of actually going anywhere. Turning is even more problematic because if you turn to the left or right you won't be facing the screen anymore. So such actions might have to be even more conventionalized. In other words, Kinect users, for instance, might well require an additional, abstract gesture language for those actions that don't fit naturally with the player being both the signs of intervention and the interactive sign. In other words, these new intuitive interfaces will require new symbolic gesture systems in order to accommodate all the types of actions required by most modern games.

The interesting thing about the technologies represented in rows one and two is that between player and game is an abstract mapping from the signs of intervention onto actions programmed for the interactive sign. What this means is that the kinds of anomalies thrown up by the technologies represented in rows three through six don't happen for the older technologies of rows one and two. In their case, all actions are essentially abstractions; none is more natural or less natural.

This is not to say that these new, more intuitive interface technologies won't find their place in the interactive entertainment industry, because they almost certainly will. The point is, we have to choose carefully what types of games they are good for. From our analysis, however, it does begin to look as if the Wii offers both the game designer and the game player the most flexible and coherent set of options.

Using CBS to answer the question "Where is the player?" has allowed us to see through the sophisticated graphics and novel interface technologies and get to the heart of the work of gameplay and the player's place in it.

SUMMARY

To understand computer games we have to understand the relationship between the player and some very complex technologies. How can such a complex system as a

computer game's program, hardware, and interface peripherals come to be so readily understood and used by so many people, most of whom have little or no knowledge or expertise with any of the technologies involved. It is a measure of the skill of those involved in making computer games that this is so and that so many people derive so much pleasure from them. The theory and analyses in this chapter have tried to make clear these relationships along with trying to understand them more objectively.

In the next and final chapter we have set ourselves two tasks. First of all, we are going to show how all the theories used throughout the book are all semiotics-based. The second task will be to use all this to answer the question that is the title of Part II of this book, "What Is a Game?"

FURTHER READING AND TASKS

For further reading there are really only the three authors already mentioned. Of these, Peter Bogh Andersen's book is not an easy read overall but part II of his book is quite readable and goes into CBS in far more detail (Andersen, 1997). Andersen goes on to use such things as Petri nets to build up a more complete characterization of signs in a variety of applications such as a drawing package and the platform game Dark Castle. Another good introduction to Andersen's work is chapter 2 of Espen J. Aarseth's book *Cybertext* (Aarseth, 1997) which is also a good read for those wishing to pursue the semiotics of games and other interactive media. Tronstad's paper on nonsemiotic acts is short and a good read, a very nice overview of an important subject (Trondstad, 2001). Finally, Janet Murray's book *Hamlet on the Holodeck* is highly recommended in general and part II gives a very good discussion of the emergence of new media (Murray, 1997).

Meanwhile, here are some tasks for you to try out your newfound knowledge on:

1. The ghosts in Pac-Man are not ghost signs: Why?
2. In Breakout you can just hit the ball anywhere or you can try and aim for a specific brick. Is one IS enough to capture gameplay? Is a GIS possible for such a simple game? How do your IS/GIS work with the CBS for the game we identified earlier?
3. Think about GIS, CBS, and the inside-out code and use them to continue your analysis of OpenCity, looking in detail at the nature of interaction in this *RTS*. It should be insightful to start with CBS and work your way up to GIS and the inside-out code.
4. Choose a game or two that use traditional console interface technologies and try and adapt them, on paper, to the row three and four technologies in Table 11.3. What problems or anomalies arise?

Chapter 12

Big Game Hunting

So, we are just about at the end of the book. But we're not quite finished yet. We have not answered the question that is the title of Part II of this book: "What Is a Game?" We, the authors that is, have got some answers: not all of them, by any means, and certainly not *the answer*. But in order to get at these answers, the first thing we are going to do is step back from the detailed theoretical studies we have been making and take a look at the big picture, the helicopter (or SimCopter) view of what we've been doing and see how it all fits together. It does all fit together!

With this big picture in mind we're going to define the "code of interaction": the code that players use to play games. The code that allows players to make sense of and therefore to make meaningful the games they play. The code of interaction will help us put together some answers to the question of "What is a game?"

The final purpose of this chapter is to discuss ways in which you, the reader, maybe a student of video games, a game developer in some capacity, or someone involved in the industry in some way or other, can put what you've learned to practical use.

We—everyone—need to be more open, more honest, more questioning about what video games really are! This chapter will bring together everything we have put forward in this book and will, hopefully, help stimulate much debate and questioning. So, first things first: how on earth does all this theory fit together?

SEMIOSPHERE

Yuri Lotman, a Russian semiotician, coined the term "semiosphere" to refer to the whole semiotic space of a culture in question (Lotman). Games do not exist in a cultural vacuum; the social codes and many of the textual codes upon which modern 3D games rely so heavily are all part of this semiosphere, the culture in which all media of whatever form exist.

All the theories introduced in Part II of this book are based on semiotics: POs, CBS, the inside-out code, and the discussion on locating the player are all semiotic. As can be seen from Part I, genre and aesthetics are definitely part of the wider field
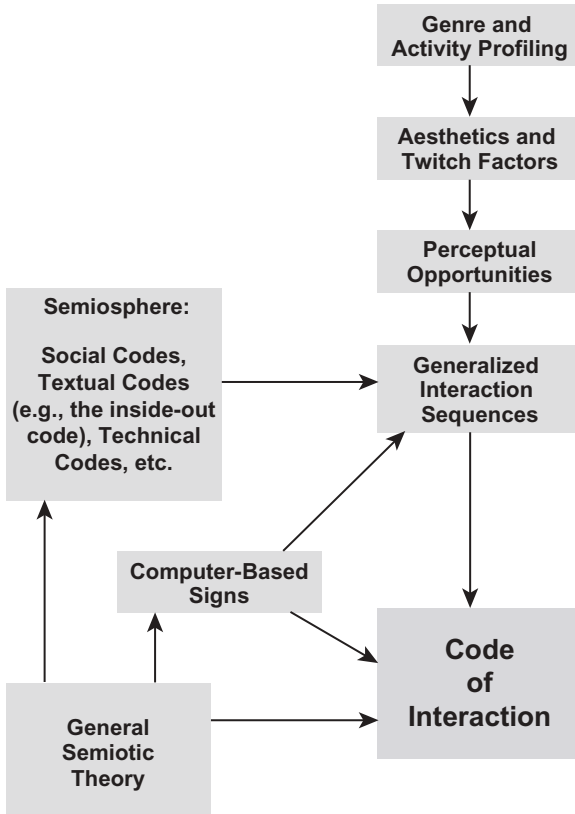
Figure 12.1   Semiosphere for video games. (See color insert.)

of semiotics. Activity profiling and twitch factors are somewhat different in that they take the results of semiotic processes—game reviewers trying to communicate what particular games mean to them—and derive statistical patterns from them. So, activity profiling and twitch factors are more akin to social science. But all the theories from Part I of this book are concerned with the game as a whole and feed in to our semiotic analysis.

Figure 12.1 is a simple diagram that models the relationships between all the theories we have studied and used in this book. It is essentially a model of the semiosphere for games and interactive entertainment.

If we start at the top right hand corner and look at the top two boxes we see the theories we introduced and applied in Part I of this book. These are all fairly general theories that look more at a game as a whole. Carrying on down the right hand side we get content-specific theories that seek to analyze what a game is actually about, the specifics of gameplay. On the bottom left of the diagram there are a series of boxes, all of which are specifically semiotics based. Notice that eventually, all arrows from all boxes lead to the code of interaction. This is the conceptual place where

meaning-making happens: where the game player makes sense of the game. We mentioned this in the previous chapter. We'll look at it in detail in the next section.

Those familiar with playing games will intuitively look for these codes and the way they are implemented. Such codes operate strongly at the paradigmatic level; the choice of what mode, for instance, to use (text, platform, 3D, etc.) has a great effect on the way people respond to the game. All together these make up the range of textual codes which both characterize a particular communications medium and enable us to interact with it and derive pleasure from it.

We noted several times the importance of the inside-out code, with which we build up our own mental map of the internal economy of the game engine. Without the inside-out code, the code of interaction and the associated textual codes would not be very effective as we would not have enough information to know how we are to play the game.

There is also the whole gamut of social codes which allow us to find aspects of the world outside the game meaningfully inside the game: body language, speech, dress, and so on. And now we seem to have the complete picture, or at least a fairly complete picture that gives an overall view of the relationships between all the theories we have been studying in this book. Of course, not all games require the player to use all these codes. We don't need to go over again the differences in this respect between Tetris and Final Fantasy, do we?

Let's repeat that all the theories focus in on the code of interaction. That is the heart of all gameplay and therefore of all games. But notice also that it is the GIS that are the filter for understanding particular games and that allow us to build models of particular gameplays. The code of interaction is the beating heart of the meaning-making process of gameplay.

THE CODE OF INTERACTION

The theories used in this book range from a fairly high-level view of games, activity profiles, genre, and twitch factors through to content-oriented views, which get pretty close to gameplay, namely, POs and computer-based signs. Aesthetics seems to bridge the divide: narrative potential, transformation, co-presence, and presence belong more with the high-level view of Part I and agency sits closely with the content-oriented view of Part II. All these views are underpinned and largely completed by semiotics. The discussions of the work of meaning, the signs of intervention, Andersen's CBS, and the inside-out code in the previous chapter seem to give us a more low-level, functional view. The code of interaction is the set of rules which allow us to recognize the significations of agency that allow us to play the games at all. This is our theory that characterizes gameplay.

Let's start at the bottom. CBS give us a very low-level view of game functionality. We would expect all content, all assets, in a game to be one of the following: interactive, actor, controller, object, layout, or ghost. In other words, whatever form an asset might take, car, chair, NPC, vulture, gun, door, bunch of flowers, Alien, or Predator, we would expect it to belong to one of these categories: to have the

interactive properties of one of these. Furthermore, we should easily be able to identify the interactive sign, or signs, because the signs of intervention link us, the player, to it, them.

We would expect the player to recognize, intuitively of course, the CBS class that the various signs belong to and make use of this in terms of both the signs of intervention and the level of agency that sits just above this. As we have already suggested, game players will instantly recognize the basic mechanics of agency: the relationship between the signs of intervention and the interactive sign—however simplistic or complicated the latter might be—and the relationships between controller, actor, and object signs. Understanding this leads to the next level of relationships, which is the aesthetics of agency, intention, and perceivable consequence. By understanding what we can affect and what can affect us—or rather our interactive sign—we are in a position to identify attractors, form intentions, and make nonsemiotic acts—issue commands through intervention signs—and assess perceivable consequences looking for rewards. Understanding this enables steps 3 and 4 in the GIS we outlined earlier; the mechanics underpinning forming and resolving intentions.

At this point we have to take account of the more high-level view. We know that intentions are strongly influenced by genre and back-story. They also influence the rewards we find in perceivable consequences and the attractor(s) we identify—within perceptual mapping structures of choice points and retainers, for instance—as the stimulus for the next round of intention forming. In conjunction with our knowledge of the CBS attributes of signs and the meanings of signs derived from the genre and back-story, on the one hand, and POs and semiotics in general, we are able to identify and prioritize attractors and from these form intentions. This leads us into repeated applications of the GIS. GIS can be nested, sometimes to many levels; an intention may be suspended while we attempt to resolve another more pressing one or a series of lower-level intentions that need to be resolved in order to resolve the higher level one. Collecting health and ammo in an *FPS* as we continue the fire fight are good examples.

Gameplay is exactly the repetition of these processes and leads to the unfolding of narrative potential, the awareness of co-presence, the experience of transformation, and hopefully presence itself. In doing this we will be aware of the type of activities we are involved with and the twitchiness of the game. The genre, activity profile, and general twitchiness will be factors which helped to influence us to play the game in the first place. This, then, is the code of interaction and is visualized in Figure 12.2.

The code of interaction looks pretty complicated and to some extent it is; our studies thus far have been suggesting this. But it is quite understandable—it is! We can see the semiotic underpinning of this cycle quite clearly in Figure 12.2. We can see, for instance, why agency (aesthetics) and attractor–reward pairs (POs) are so complementary. Attractors and perceivable consequences are both on the plane of the signifier, the lilac swathe that runs from the bottom left to the top right corner. Intentions and rewards are on the plane of the signified—the pinkish swathe that runs top left to bottom right. Attractor–intention pairs and perceivable consequence–
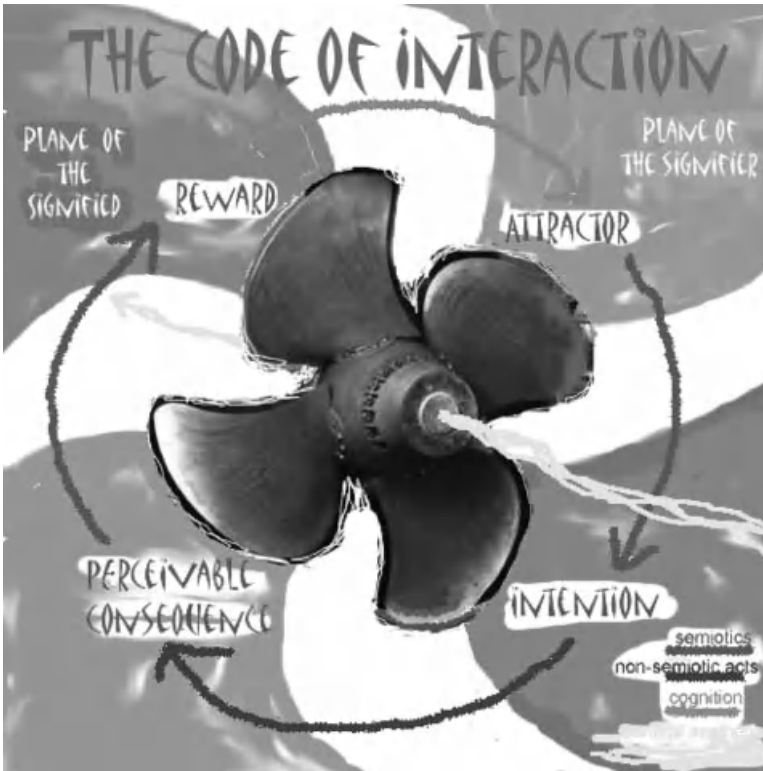
Figure 12.2   The Code of Interaction. (See color insert.)

reward pairs (the purple arrows) are signs in their own right. These general signs of interaction are further linked by a green arrow and a blue arrow.

The green arrow represents cognition—the process of evaluating a reward and identifying the next attractor to focus on. Of course cognition doesn't just happen between recognizing a reward and identifying the next attractor to focus on. The green arrow does, however, represent the part in the process where the social and media codes come into play. The blue arrow represents the nonsemiotic act of issuing commands to the console/PC via the signs of intervention. But even these, as we observed in the last chapter, have a semiotic element to them for the player in the sense that these will be considered nameable actions, by the player, which will align with those in the game's activity profile. And remember that on the plane of the signified we find not only denotation but also the levels of connotation and myth which should build up through the player's repeated cycles of interaction.

The ship's propeller not only reinforces the cyclic nature of interaction but also seeks to signify the development of the experience of the game, the buildup of meaning, over time (yellow arrow), and thus the diachronic development of game-play and the associated aesthetic pleasures of narrative potential, transformation,

co-presence, and presence that go with it. Genre, activity profiling, and twitch factors can now be seen as ways of characterizing general properties of the game that arise out of this diachronic development. The propeller is thus a synecdoche which signifies not only a very large cargo ship or passenger liner but also the ocean it sails in. The ship is a metaphor for the game engine which we sail on through and explore the ocean of the game space. The game is an exotic holiday that takes us far away from our everyday lives. Although rather obvious, this image does, hopefully, signify the scale and complexity of the code of interaction for even apparently simple games.

We have seen that interaction is a complex code that game players employ somewhat effortlessly in learning to play new games and in the playing of games they are familiar with. The code of interaction does not refer to the gameplay of a particular game but to the rules we have learned, often intuitively, by playing games and coming to understand their general characteristics. In a real sense all we did in the previous chapter was to try to put into words and theory that we already knew in some nonverbal, nontheoretical, largely unconscious fashion.

Just to make sure we're all clear as to what the code of interaction is all about, let's discuss it in terms of a couple of games we studied earlier in the book: Breakout and Shenmue. There will also be an exercise for you to do at the end of this chapter. Can you guess what it is?

So, imagine you've just started up Breakout; the game loads and then . . . what? The white square that is the "ball" appears just below the darker rectangles that are "bricks" in the "wall" and moves downward at an angle; the first and only attractor. The only sensible intention to form, if you're trying to win, that is, is to get the paddle to the place where the ball is headed at the bottom of the screen so you can bat it back upwards. The perceivable consequence you want is the ball heading back up the screen toward the wall. The reward is a brick dislodged and a new attractor, the same one essentially. Everything sets off again, the cycle of interaction repeats itself; the propeller turns; the ship moves forward. There is a weak narrative potential as the cycles progress and, hopefully, the bricks in the wall are removed. There is perhaps a loss of self but not transformation as such, no co-presence but it can be quite gripping so there might be presence for a while at least. The inside-out code will come into play for a while as you work out how the bounces work, the angles of deflection, and how the lives and points change. There are no social codes. Well, there is the word "Breakout," a powerful signifier of prison and films about prison escapes. Yes, social codes even apply to Breakout. It's still a great game and analyzing it using our methods and the Code of Interaction gives us some insight as to why.

Shenmue is, as we know by now, going to be quite different. For a start, we are not going to be able to give a complete characterization of its code of interaction, just a flavor, a glimpse. But here goes. Very early in the game—you still haven't got much further than the quiet suburb where you live with you grandmother—you are walking down the street and there is a shrine on your left. You hear a cat meowing in a rather pathetic way. Inside the shrine you find a kitten, a few months old, that

you, Ryo that is, judge to be hungry and lost. You have already gone through a cycle here in identifying and responding to the audio attractor of the cat's meow and forming and resolving the intention to find the cat that is meowing.

But now you have a choice: ignore the cat and get on with resolving your main intention, trying to find anyone who saw your father's killers making their getaway. Or, set yourself a new intention of finding something for the cat to eat and put your main intention on hold for a while. If you choose the later—and a little altruism in a game like Shenmue is often rewarded—then you have a hierarchy of intentions: to feed the cat you need to find some food, but where can you find some cat food? There is a small general store nearby and a convenience store downtown. You could visit the shops and find something that the cat could eat. And so we have nested intentions, remembered attractors, multiple perceivable consequences and a hierarchy of rewards. All this reinforces:

- Narrative potential: The little side drama of the hungry cat.
- Our transformation as Ryo Hazuki.
- Co-presence: We'll meet more people.
- Presence: All this exercise of agency adds to our sense of involvement and acceptance of the game world.

In the end, your reward is talking to the little girl whose cat it is and who saw a black car speeding down the road soon after your father was murdered . . .

Breakout and Shenmue both adhere to the code of interaction despite their apparently sharing nothing in common. What they do share is what is at the heart of all games: the repeated patterns of interaction.

Maybe we have attempted to explain that which did not at first seem to need to be explained. You all knew this, didn't you? If that is the case then interaction is not just a code but a code supported and enabled by a myth, a myth in semiotic terms of course. Remember, a myth in semiotics is not some fantastical story that probably never happened but a deeply rooted set of cultural beliefs that we take for granted as being in some way "natural," as being how the world works.

The myth of interaction provides the motivation for all this: for the predilection of people to spend huge amounts of time and energy playing these games; and for the creation of a huge industry that feeds and sustains this predilection by designing and building ever more games and evolving the technology, the platforms, on which these games can be played.

THE MYTH OF INTERACTION

One way to get at this myth is to do a paradigmatic test on the verb table for a game; remember verb tables. Take a game like Driver, which we have spent some time examining. Make a list of the present participles that characterize what forms of agency we are offered. We get such things as: steering, accelerating, slowing down, hand-brake turns, and so on. This is, of course, the process we went through to get

at GIL's activity profiling software. Now go on to list those things that you would expect to be able to interact with in a real car that you cannot with Driver: gears, indicators, lights, horn, radio, doors and windows, heater, and so on. There is actually far more you can't do than you can; far, far more. In terms of driving a car, the agency in Driver is about as simplified and whittled down as it is possible to get.

Games do this all the time. We believe we are offered agency, the agency to drive a car, but we are only given very little of it. We are given just enough to satisfy the objectives of the game. We live in world where taking part has become more important than just being there. Playing sports, particularly extreme sports, has become cooler than watching it. We can't just watch wild animals on TV, we have to go and see them, walk with them, swim with them. Making a difference, at least the appearance of it, is not some idealistic dream for the young; it has become a way of life for almost all. Yet if we all went off and did all the things we dreamed of for ourselves the world would become swamped by people doing extreme sports and making a difference in exotic locations. The world, the environment couldn't cope! Games rely on our belief in the myth of interaction; they rely on our need, the recent need in terms of cultural evolution, to be an individual taking part and not just on the sidelines looking in.

When we are offered the limited form of agency that games are capable of we accept it largely without question and in doing so we demonstrate our acquiescence to that myth. In the very first chapter we summarized Janet Murray's characterization of the evolution of media (Murray, 1997). In particular she identifies the embryonic medium where people anticipate the new medium prior to the technology itself being available to support it. This was true for interactive digital media. There were all sorts of electromechanical and other nondigital but interactive media developed before computers made interactive media truly possible. The fairground in the early to mid-twentieth century was the place you went to interact: to fire guns, to ride dodgems and spaceships and the house of horrors. In their very early days films were very short and you found them in amusement arcades; "What the Butler Saw" and so on. But they were also interactive. You had to turn a handle to make the movie move; and you could stop it when you wanted to view a single frame. There were interactive novels, "make your own adventure" novels, where choice and chance determined which section/chapter you read next. There were artists working with happenings and installations that were interactive to a certain extent. Artists also attempted to develop interactive video and such like. The need to interact has been taking increasing hold on us as the twentieth century has progressed and turned into the twenty-first. For many people, games are the means by which they satisfy their need to take part: a need created by their belief in the myth of interaction.

It seems that the myth of interaction arose and became accepted in western culture perhaps a hundred years ago or more; way before the computer made interactive games possible. The myth enabled the game, not the other way round. The computer game is just one demonstration of our acquiescence to it. So another reason people play games is that they are culturally driven to; and what big business satisfying this acquiescence, this drive, it has turned out to be.

And now, there was a question; wasn't there?

WHAT IS A GAME?

A game is not its genre or activity profile; nor its rendering style; nor how realistic it is, or is not. Certainly, it is not the number of weapons or vehicles, it certainly is not how you win or lose or, indeed, whether you can win or lose at all. Any game will be some or all of these but none of them characterize what a game actually is. In Chapter 3 we started to learn that games are about what the player actually does. From the high-level view of activity profiling, to the step by step view of perceptual opportunities, and finally to the highly abstract and focused insights given to us by computer-based signs: a game is how it implements the code of interaction.

Games are designed to grab players' attentions, to entrance them and in doing so to force them to addictively follow through thousands and thousands of cycles of interaction with limited degrees of variation in the name of play or entertainment or achievement or whatever. A game is the succession of moments of intervention that compel the player to make the next intervention and the next and the next, perhaps hundreds of times in every minute. A good game, a great game, is one in which chasing these endless, more or less repeated moments of intervention become so compulsive for the player that nothing else matters. A game is essentially compulsive repetition. That is what a game is; and that is why some people play them and some people don't.

The rest is, quite literally, window dressing. Pared down games, such as simpler casual, puzzle, and retro games, rely on the very bare minimum of agency and presence but still manage to engender compulsion in their players. Other games dress up the window with extremes of narrative potential, transformation, and co-presence, building amazingly detailed worlds and landscapes, epic story lines and character sets. Some games add to this the online presence of thousands and thousands of players. But at the heart of it all there still has to be this compulsive repetition at whatever frequency, fast and furious or measured and thoughtful; that is what a game is. Simple; isn't it? Yes, in a sense; but it is probably one of the hardest media to succeed in. But maybe by understanding the cycle of compulsive repetition in more detail it will be easier to master its art in new games yet to be designed and made.

In a very fundamental way, video games are quite different from virtual reality despite the similarities we have alluded to in earlier chapters. The illusion of some imagined reality is part of some games, but it is an illusion. However sophisticated the illusory world, the internal economy and the program logic for updating it will be such that just about anyone can understand what is going on. Notice that the program logic for rendering the visual gamespace with its supporting physics and artificial intelligence and so on is always immeasurably more sophisticated than that for the internal economy. Video games are sophisticated illusions; they are, in a very real sense, confidence tricks. SimCity, whatever version, presents us with a model of millions of possible cities that just about anyone on earth can enjoy building and being mayor of. What an amazing achievement. How compulsive is that?

But before we finish, we have yet one final question:

HOW DO YOU GET OUT OF HERE?

The theories in this book can be seen as a journey, an invasion that takes us from some strange abstract point in an imagined space looking down on the world of games seen as genres and activity profiles down through the compulsive acts of gameplay and what they mean, and deeper still until we reach another even stranger abstract space, the space of CBS, which characterizes all games in such an elegant and simple way and yet tell us nothing about any one in particular. Our journey, our invasion, will go no further, at least for the time being. It is time to extricate ourselves from this strange, secret heart of the video game and as we do so reflect on what we have learned and what use it could be to us. We ended up deep in the heart of a compulsive, repetitive, abstract space. There's a whole world out there we need to get back to.

The salutary lesson we learned from CBSs is that the interactive sign, the playable character, whatever you wish to call it, however minimal and simplistic and dumb or however grandiose and complex and sentient it might be, can be either of these or anything in between; or indeed it can be even simpler than the former or far more complex than the latter. Our point of presence in the game need be nothing more than a simple point, a single pixel. The game starts when we begin to imagine what that point of presence can do, what effects it can have on whatever else is going to be in this new game world.

In fact, if you really want to get back to basics, this is the place to start. Imagine the simplest possible interactive sign and nothing else; just a blank screen and a single contrasting pixel. Imagine what happens when you try and do something with this single pixel? Does it move, grow, vibrate, spit out other pixels? Does it make a noise, disappear only to reappear somewhere else? It can do anything you want it to do. You can get it to create anything you like, anything at all. That's how powerful your imaginary game engine is. What wonders can you imagine your simple interactive sign to get up to? It's a game you can play.

And playing this game helps you design more games. Substitute in: a person, a fire alarm, a tennis racket, a fried egg, some garden weeds, a brick, random words cut from a newspaper, a sticky piece of gum on the pavement, the pavement; put that in, put anything in at all, and start to play with it. Start to create things with it. What things? Move these objects, break them up, build them up, destroy them; make them able to do things for themselves. Keep going, keep playing, keep creating your game.

When you are ready, try and pin it down a bit. Try thinking of some GISs so you can begin to structure the game a bit more. If it is a simple, casual game, you only need one GIS. If it is a complex roleplaying or action adventure game, you might need a lot of GISs. And what needs to come into play so your GIS(s) make sense? Are there textual codes and/or social codes that the player needs to use? How does the inside-out code work for the player? You might not need any semiotic codes beyond the media-specific ones.

What are the signs of intervention and what effects do they have? Does the door open automatically as you approach; do you have to use the door handle and open

the door; do you hit a button and sit back and watch the perceivable consequence of a cut scene of the door opening, your character stepping through to the other side? A door is very specific at this stage. Wouldn't some abstract pattern of pixels do just as well? Think about what you do more than what you see. What happens because you pressed a button or waved the Wii remote around or spoke the right words into your DS? Interventions, nonsemiotic acts you transmit to the game engine to test the enigma of the inside-out code. Over and over again you compulsively try to push this game forward.

In building up your GIS and thinking about what the player needs to make sense of them you are actually building up fragments, sections, vertical slices of gameplay. Is this going to work? It is easy to change anything you like. At this stage you should change anything and everything you like. Remember paradigmatic analysis from Chapter 10? That is exactly what you should be doing here. Change the interactive sign, change it again and again; do silly things with it, make silly substitutions just to get an idea of what might and might not work. It is easier to change things now than at any time in the game design process; remember to do your paradigmatic analysis. Oh! So this is part of the game design process, is it? Yes; yes it should be.

Now we're getting ready to ask the single most important question of all. How is compulsive repetition going to snare the players of your new game? Why won't they be able to stop playing? This is not easy. Remember from Part I, different types of players and very often the same player at different times of the day or in different moods will want different types of game. Some people will want to roleplay, to become someone else. Some people will want to forget about being a person, who and what they are, completely, for a while. But somehow, whatever the game, compulsive repetition has to happen in your players; how and why is it going to happen?

What is going to grab people's attention? What are the attractors that will focus their minds on the game and away from the rest of the day around them? What will they be rewarded with? And what will be the next attractor they might, should, will chose? Perceptual opportunities are at the heart of compulsive repetition.

Let us suggest some questions to ask concerning how the code of interaction is implemented and how to generate the desire for compulsive repetition in its players. First of all, does the player have time to think? This is of course related to twitch factors but it is also important in determining what player types might be interested in the game. No time to think means killers and maybe some managers, but probably not wanderers. If there is a lot of time to think then this means managers and wanderers and maybe even some participants.

How difficult is it to choose the next attractor? If there is only ever one then we are talking about puzzles, such as Tetris and Breakout, and classic platformers. If a small number of attractors, then we are talking about racing games, shooters, and the like. If there are lots of attractors then we are talking some action adventure games and certainly *RPGs* as well as virtual worlds such as Second Life.

How many signs of intervention are there? A very small number of deep controls will appeal to a whole range of demographics. A large number, including many combos, will only appeal to hardcore players, killers certainly and managers, if the latter have time to think.

Do any of the aesthetics apart from agency and presence come into play? Transformation always comes into play in the sense of "loss of self" or "enhanced self" or "other self." In determining player types this basic distinction is very important. Does narrative potential not make much sense, or is there a back-story, does it turn into virtual storytelling? How important for the game is co-presence and does this mean being with other people or NPCs?

Do semiotic codes such as the social code need to be employed to make sense of and play the game? If yes, then the real world of people and things is central to the game and those who want to lose themselves in a game might be put off.

Is the internal economy set in the game engine, or is it in the hands of the players? If the latter is the case then people who might "play" Second Life may well be interested because the game or environment will be a lot closer to reality. If the former, then the main game-playing types will be happy with the illusion of whatever reality they have bought and are playing into.

These are just a few of the questions you could ask; there are many more. And these questions are not mutually exclusive. You can have a game with lots of attractors to choose from that may or may not give you time to think. "Loss of self" can go with either of the possibilities in the previous sentence, but does it go with the need for strong narrative building and extensive use of social codes? So the combinations are quite endless and all fit within the code of interaction as laid out in Chapter 11.

It is amazing to think just how many game types actually fit within what first appears to be the very rigid, unforgiving concept of compulsive repetition that essentially defines computer games. To help you think about compulsive repetition, you could also think about an appropriate activity profile of the genre characteristics of your game. Will these characteristics appeal to target player types? Throughout the book we've made use of GIL to support as much of our theoretical and analytical work as we can. You can go on using GIL yourselves. It is a great starting point for playing with ideas about games in a very free and easy manner. You can, for instance, set up your own activity profile and see if anyone has made a game like that already. On its own, GIL is an amazing resource. Used in conjunction with the other theories and models in this book it is even more amazing and powerful. On the website you will find tutorials and other materials to help you make the best use of it.

What about narrative potential, transformation, and co-presence? Can these help to give you an angle on why compulsive repetition will overtake your game's players? Think about the code of interaction. The analysis provided by GIL can be applied to help show what drove the whole interactive process forward; it is the buildup of these pleasures that feeds compulsive repetition.

You are almost out now, almost free. You could make a run for it. No one would be any the wiser; but you might be!

BIG GAME HUNTING

It is now over ten years since the first paper on perceptual opportunities was published and even longer since the theories and processes that are at the heart of this

book began to be researched and investigated. It is over five years since the very idea of activity profiling using software to support the other theories was first envisaged. At that time we and the rest of the games industry were solely concerned with what we came to call big games: most games released for consoles. These huge game worlds require upwards of thirty to forty hours of your precious time and attention to complete in full. We literally went big game hunting. We wanted to find out what made them tick, what made them so compulsive.

Since then the game world has fragmented, broadened, and generally started to appeal to a far wider spread of the population. We investigated this in some detail, particularly in Chapters 6 and 11. So we don't just hunt big games any more. We hunt any type of game and, as we have seen in the last couple of chapters, fundamentally they are all related. The industries that make up the game world might be fragmented but the games themselves are not. As we have shown in this book, big games are not fundamentally different from casual games; it's just a question of scale and back-story. There are just video games and some are bigger than others but at the heart of it all is compulsive repetition; you'd do well to remember that. The gaming world is actually opening up. New business models are emerging that mean it is easier to break into the market and easier to do so with smaller, less complex games that maybe do not need the major investment of a publisher.

So it is over to you now: you are the one!

Glossary

action: property of a **computer-based sign** that can affect other **signs**. The ghosts in Pac-Man have the action property because they can kill Pac-Man. Part of the **semiotic** theory of interaction, introduced in Chapter 11. See also **actor sign**.

activity group: one of the 49 basic gameplay activities that GIL calculates values for, part of a game's **activity profile**, introduced in Chapter 3.

activity profile: graph of the activity groups important to a particular game, part of activity profiling, introduced in Chapter 3.

actor sign: a **computer-based sign** that represents an active agent of some sort in a game. The ghosts in Pac-Man are actor signs because they have **permanence**, **transience**, and **action**, but not **handling**. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

aesthetic: the particular pleasures to be gained from a communications medium: games, films, paintings, and so on. Introduced in Chapter 4. See also **agency**, **narrative potential**, **transformation**, **co-presence**, and **presence**.

agency: the pleasure of interacting with a game, one of the **aesthetic** pleasures of games introduced in Chapter 4. See also **intention** and **perceivable consequence**.

attractors: content that stimulates **intentions**. A type of **surprise** that forms part of **perceptual opportunities**, introduced in Chapter 7. See also **connectors** and **rewards**.

challenge points: an **intention** we have to satisfy before we can move on in the game. Part of **perceptual mapping**, introduced in Chapter 7. See also **choice points**, **retainers**, and **routes**.

choice points: a point in the game at which we can form and choose from multiple intentions. Part of **perceptual mapping**, introduced in Chapter 7. See also **challenge points**, **retainers**, and **routes**.

code: rules that allow us to make meaning of **signs** in a particular medium. For example, recognizing that underlined text in a web page is a link but that underlining is only there for emphasis in a newspaper or magazine. Part of **semiotic** theory introduced in Chapter 10.

code of interaction: the **code** at the heart of gameplay, the code of compulsive repetition. At the heart of the **semiotic** theory of interaction, introduced in Chapter 12.

computer-based signs: very low level view of the way **signs** in a game interact in terms of **permanence**, **transience**, **handling**, and **action**. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

connectors: content that helps the player to retain focus on a current goal. A type of **surprise** that forms part of **perceptual opportunities**, introduced in Chapter 7. See also **attractors** and **rewards**.

connotation: extraordinary meanings, **signified** by a **sign**: in a game, a chair can be a weapon or a throne for a king and so on. Part of semiotic theory, introduced in Chapter 10.

conquerors: people who want to win and beat the game. One of the four generic player **personality types** as defined by International Hobo, introduced in Chapter 6.

controller sign: a **computer-based sign** that affects other signs but does not itself change. The walls in Pac-Man are controller signs because they have **permanence** and **action** but not **handling** and **transience**. They restrict Pac-Man and the ghosts to the "corridors" but do not change in any way. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

co-presence: the **aesthetic** pleasure of being present with other sentient characters in a game. One of the **aesthetic** pleasures of games introduced in Chapter 4.

denotation: the everyday meaning, **signified** by a **sign**: a chair is to sit on. Part of **semiotic** theory, introduced in Chapter 10.

diachronic: **signs** that are related over time, as in films, TV programs and, of course, games. Part of **semiotic** theory, introduced in Chapter 10.

encyclopedic: the depth of description of the game world, part of Janet Murray's digital environment characteristics, introduced in Chapter 4.

generalized interaction sequence: abstract view of **interaction sequences** that applies to a number of games. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

ghost sign: a **computer-based sign** that has only action. This **sign** only becomes apparent through the effect it has on other signs. Hidden trap doors in platform games are typical ghost signs. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

handling: property of a **computer-based sign** that it can be controlled in certain ways through the game interface. Pac-Man possesses handling; the player can change the character's direction of movement. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

icon: the **signifier** of a sign closely resembles the **signified**, as in a photograph. Introduced in Chapter 10. See also **semiotics**, **index**, and **symbol**.

index: the **signifier** of a **sign** is causally related to the **signified**, as in smoke from a fire, footsteps in the sand, and so on. Introduced in Chapter 10. See also **semiotics**, **icon**, and **symbol**.

inside-out code: the **code** we use to work out information the game engine hides from us in order to make the game more challenging. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

intention: the pleasure of setting goals, short and long term, when playing a game. One of the **aesthetic** pleasures of games introduced in Chapter 4. See also **agency**.

interaction sequence: list of interactions in a particular game ordered over time. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

interactive sign: a **computer-based sign** that represents the playable character in a game for instance. The playable character will have **permanence**, **transience**, **handling**, and **action**. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

intertextual: referencing **signs** from one medium in another, for example: the exotic fruits in Pac-Man reference slot machines (fruit machines, one armed bandits, and so on). Part of **semiotic** theory, introduced in Chapter 10.

layout sign: a **computer-based sign** that has only **permanence**. Layout signs take no part in gameplay. They are typically used as backdrops in platform and point-and-click games to "set the scene." Part of the **semiotic** theory of interaction, introduced in Chapter 11.

managers: people looking for strategic or tactical challenges. One of the four generic player **personality types** as defined by International Hobo. Introduced in Chapter 6.

myth: meaning systems that we take for granted as being natural in some way, for example, consumerism, capitalism. Part of **semiotic** theory, introduced in Chapter 10.

myth of interaction: semiotic myth that assumes we should be able to take part, to make a difference, as opposed to being a passive recipient, a member of the audience. Part of the **semiotic** theory of interaction, introduced in Chapter 12.

narrative potential: the pleasure of the coherent build-up of agency into meaningful patterns or even stories, one of the **aesthetic** pleasures of games introduced in Chapter 4.

object sign: a **computer-based sign** that typically signifies scores and other game statuses. Object signs have **permanence** and **transience** only. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

paradigm: the relationship between the **signs** we perceive in a **text** and those that could have been chosen. Why is Pac-Man a pizza with a slice taken out instead of an apple pie or a doughnut. Part of **semiotic** theory, introduced in Chapter 10.

participants: people who just like to participate in a game, to join in: very story-oriented. One of the four generic player **personality types** as defined by International Hobo, introduced in Chapter 6.

participatory: the ability to affect change in a game, part of Janet Murray's digital environment characteristics, introduced in Chapter 4.

perceivable consequence: the pleasure of finding out what happens as a result of interacting with a game. One of the **aesthetic** pleasures of games introduced in Chapter 4. See also **agency**.

perceptual mapping: combinations of **perceptual opportunities** that give rise to major gameplay situations. Introduced in Chapter 7. See also **choice points**, **challenge points**, **retainers**, and **routes**.

perceptual opportunities: theory which deals with the game content and suggests possibilities for interaction. Introduced in Chapter 7. See also **sureties**, **surprises**, **shocks**, and **perceptual mapping**.

permanence: property of a **computer-based sign** that it is always associated with the same signifier. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

player types: generic personality profiles of the different types of game players as defined by International Hobo, introduced in Chapter 6. See also **conquerors**, **managers**, **participants, wanderers**.

presence: the player's sense of being part of, of being in, the game world to the exclusion of the real world around them. One of the **aesthetic** pleasures of games introduced in Chapter 4.

procedural: the degree to which characters, objects, and so on are functionally programmed into the game, part of Janet Murray's digital environment characteristics, introduced in Chapter 4.

retainer: group of **surprises** that constitute major sites of interest and interaction, for example, mini-missions, fire fights, puzzles, and so on. Part of **perceptual mapping**, introduced in Chapter 7. See also **challenge point**, **choice point**, and **route**.

rewards: found in **perceivable consequences**, the payoff for taking action. A type of **surprise** that forms part of **perceptual opportunities**, introduced in Chapter 7. See also **attractors** and **connectors**.

route: groups of surprises that guide us round a game world. Part of **perceptual mapping**, introduced in Chapter 7. See also **challenge point**, **choice point**, and **retainer**.

semiotics: the study of signs in terms of **signifier** and **signified**. Introduced in Chapter 10.

shocks: unwanted content that reminds us we are playing a game. Part of **perceptual mapping**, introduced in Chapter 7. See also **sureties** and **surprises**.

sign: the basic unit **semiotic** theory, a sign consists of a **signifier** and a **signified**. Introduced in Chapter 10.

signified: the meaningful aspect of a sign, what the signifier brings into our minds. Introduced in Chapter 10. See also **semiotics** and **signifier**.

signifier: the aspect of signs that we perceive in the world around us. Introduced in Chapter 10. See also **semiotics** and **signified**.

signs of intervention: buttons, joysticks, and so on, any technology that allows us to signal our intentions to the game engine to control the **interactive sign**. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

spatial: the extent of the game world, whether that be in 3D or links between locations in text adventures and so on, part of Janet Murray's digital environment characteristics, introduced in Chapter 4.

sureties: game content that helps to create believability, goes largely consciously unnoticed by players. Part of **perceptual opportunities**, introduced in Chapter 7. See also **surprises** and **perceptual mapping**.

surprises: content the player pays conscious attention to during gameplay. Part of **perceptual opportunities**, introduced in Chapter 7. See also **attractors**, **connectors**, **rewards**, **shocks**, **sureties**, and **perceptual mapping**.

symbol: the **signifier** of a **sign** is related to the **signified** purely by convention: the words dog and chien, for instance, both stand for canines and things to do with canines in English and French respectively. Introduced in Chapter 10. See also **semiotics**, **icon**, and **index**.

synchronic: **signs** we perceive at the same time, as on the page of a magazine. Part of **semiotic** theory introduced in Chapter 10.

text: the term used in **semiotic** theory for anything that can be analyzed as being made up of meaningful signs: a novel, a film, a newspaper, a game, and so on. Introduced in Chapter 10.

transformation: the pleasure of becoming someone or something else in gameplay, one of the **aesthetic** pleasures of games introduced in Chapter 4.

transience: property of a **computer-based sign** whose signifier may change but is always associated with the same object or character. The ghosts in Pac-Man are transient: they are represented by five or more signifiers. Part of the **semiotic** theory of interaction, introduced in Chapter 11.

twitch factor: measure derived from a game's **activity profile** of how intense or measured interaction with a game is, part of activity profiling, introduced in Chapter 3.

virtual environment: alternative term for a virtual reality that does not emphasize "reality"; other worlds, artificial and imagined, are also possible.

virtual reality (VR): using graphics and sound to create the impression of a 3D world we can interact with.

wanderers: people looking for a fun experience in a game. One of the four generic **player types** as defined by International Hobo, introduced in Chapter 6.

List of Games

AS-OceanFloor
- http://www.youtube.com/watch?v=2tAfyZNmO6Q (speed run)
- http://strategywiki.org/wiki/Unreal_Tournament/Assault#Ocean_Floor (strategy)

Breakout
- http://www.youtube.com/watch?v=JRAPnuwnpRs (video clip from 1982)
- Google Images has many screenshots of this game

Colin McRae Rally 2005
- http://uk.gamespot.com/pc/driving/colinmcraerally5/review.html (review and videos)

Dark Castle
- http://en.wikipedia.org/wiki/Dark_Castle
- Google Images has many screenshots of this game

Driver
- http://en.wikipedia.org/wiki/Driver_(video_game)

Electroplankton
- http://www.youtube.com/watch?v=28UDxIQiaIY

Final Fantasy X
- http://uk.gamespot.com/ps2/rpg/finalfantasy10/index.html (review and videos)

Gitaroo Man
- http://www.youtube.com/watch?v=fYY6jcATK4E (gameplay video)

Gran Turismo 4
- http://uk.gamespot.com/ps2/driving/granturismo4/index.html

Great Street Games
- http://www.kma.co.uk/2009/10/great-street-games/
- http://www.flickr.com/photos/pauljw/4058560411/

Kinect Joy Ride
- http://www.youtube.com/watch?v=FbMyUs8Rlo8
- http://uk.xbox360.ign.com/articles/113/1132361p1.html

Legend of Zelda: The Twilight Princess
- http://www.youtube.com/watch?v=kBRGtbXJYAs&feature=related (IGN video review)

Lunar Lander
- http://www.atari.com/play/atari/lunar_lander (playable game)

Pac-Man
- http://www.namcogames.com/pc_games/pac_man (free trial game)
- http://www.youtube.com/watch?v=uswzriFIf_k (gameplay video)

Parappa the Rappa
- http://www.youtube.com/watch?v=F5Pm7BL-hyo&feature=related (gameplay video)

Resident Evil 4 and 5
- http://en.wikipedia.org/wiki/Resident_Evil_%28video_game%29 (original game RE1)
- http://www.youtube.com/watch?v=eJfvSpc7cn8 (gameplay video RE4)
- http://uk.xbox360.ign.com/articles/960/960151p1.html (RE5 review)

Rez
- http://ps2.ign.com/articles/166/166546p1.html
- http://www.youtube.com/watch?v=A4EFNWe4mCc (Area 2 gameplay video)

Sacred
- http://en.wikipedia.org/wiki/Sacred_(video_game)

Second Life
- http://secondlife.com/whatis/

Shenmue
- http://en.wikipedia.org/wiki/Shenmue

SimCity
- http://simcity.ea.com/play/simcity_classic.php

SimCopter
- http://uk.gamespot.com/pc/sim/simcopter/review.html (game review)
- http://www.youtube.com/watch?v=JE1l27SNBhw (original trailer)

Sin
- http://en.wikipedia.org/wiki/Sin_(video_game)
- No images of or material on the Sin City level have been found

Spacewar:
- http://museum.mit.edu/nom150/entries/1437
- http://en.wikipedia.org/wiki/Spacewar!
- http://spacewar.oversigma.com/

Star Fox
- http://www.youtube.com/watch?v=A7TF5evojYA (gameplay video)

Stunt Race FX
- http://www.gametrailers.com/user-movie/stunt-race-fx-sunset-valley/300017 (gameplay video)

Tempest (Tube Shooter)
- http://en.wikipedia.org/wiki/Tempest_(arcade_game)
- http://www.youtube.com/watch?v=1DZYfzo8BGQ (The Story of Tempest, one of six)

Tetris
- http://www.tetris.com/
- http://www.tetrisfriends.com/games/Marathon/game.php?ref=from-homepage-ad (play Tetris)

Thief
- http://en.wikipedia.org/wiki/Thief_(series)
- http://www.youtube.com/watch?v=01oPyXTIFys&feature=related (gameplay)

Unreal Tournament
- http://www.unrealtournament2003.com/general/history.html (history of UT)
- http://www.youtube.com/watch?v=EsJaznqV5PE (UT Retrospective; *note*: bad language at end of video)

Wreckless: The Yakusa Missions
- http://www.youtube.com/watch?v=URhjjHPlqWI (GameSpot video review)

Zork
- http://www.xs4all.nl/~pot/infocom/zork1.html (play online; Java plug-in required)

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205

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Index

Page numbers in *italics* refer to figures; those in **bold**, to tables

207