Half-Real

Video Games between Real Rules and Fictional Worlds

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▶ Note on the Web Site

The book's Web site (http://www.half-real.net) provides a collection of resources about video games and video game theory. These include a continually updated dictionary of video game theory, a list of suggested readings, links to relevant Web sites, and several tools on which to base video game experiments.

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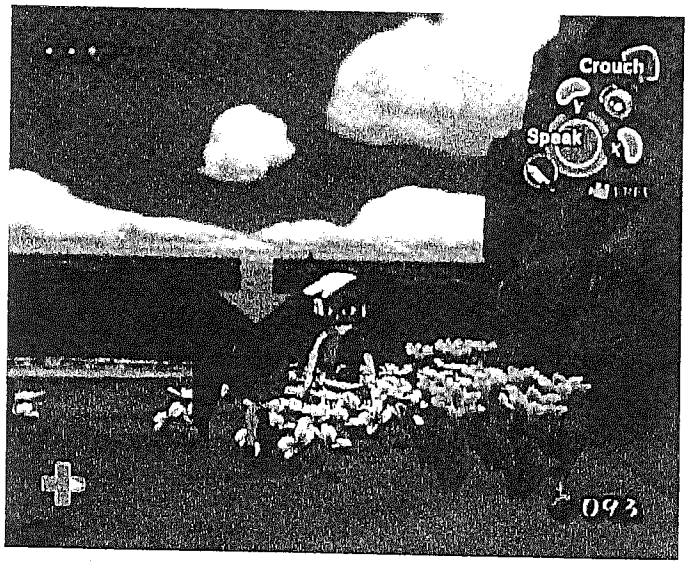
INTRODUCTION

In the title, *Half-Real* refers to the fact that video games are two different things at the same time: video games are *real* in that they consist of real rules with which players actually interact, and in that winning or losing a game is a real event. However, when winning a game by slaying a dragon, the dragon is not a real dragon but a fictional one. To play a video game is therefore to interact with real rules while imagining a fictional world, and a video game is a set of rules as well as a fictional world.

Legend of Zelda: The Wind Waker (Nintendo 2003a) in figure 1.1 has been praised for its expressive graphics, lavish world, and detailed storyline. In the picture, the player's character has traveled far from his home island in search of his recently abducted little sister. In addition to the fictional world of the game, not only does a variety of on-screen displays provide the player with much information, there is also a curious arrow bouncing over the small girl in the flower field. The arrow indicates that we are playing a game with rules and a goal to work toward. It tells us that we can interact with the girl, and that she may help us progress in the game. It also illustrates that although the graphics depict an elaborate fictional world, only a small part of this world is actually implemented in the rules of the game; and the arrow indicates which part of the game fiction can also be found in these rules. Thereby *Legend of Zelda: The Wind Waker* points to a fictional world, and it points to the rules of the game. These are the two things that video games are made of: real rules and fictional worlds.

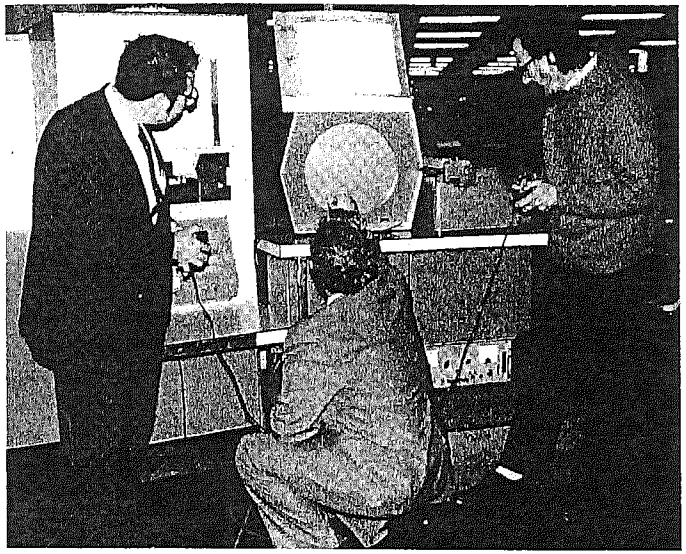
In having fictional worlds, video games deviate from traditional nonelectronic games that are mostly abstract,[1] and this is part of the newness of video games. The interaction between game rules and game fiction is one of the most important features of video games, and it is a central



| Figure 1.1 |
Legend of Zelda: The Wind Waker (Nintendo 2003a): The arrow points to what is important according to the rules of the game.

theme of this book. Their interaction is present in many aspects of games: in the design of the games themselves; in the way we perceive and use games; and in the way we discuss games. This interaction gives the player a choice between imagining the world of the game and seeing the representation as a mere placeholder for information about the rules of the game.

In addition, we face a choice between a focus on the game itself or on the player of the game: We can examine the rules as they are found mechanically in the game program or in the manual of a board game, or we can examine the rules as something that players negotiate and learn, and at which they gradually improve their skill. We can also treat the fictional world as a fixed set of signs that the game presents, and we can treat the fictional world as something that the game cues the player into imagining



| Figure 1.2 |
Alan Kotok, Steve Russel, and J. M. Graetz playing *Spacewar!* Courtesy of the Computer History Museum.

and that players then imagine in their own ways. This book's intent is to integrate these disparate perspectives into a coherent theory of video games.

The Old and the New

The history of video games is both very brief and very long. The first video game was probably the 1961 *Spacewar!* (figure 1.2) (Russell 1961). The video game is thus a little more than forty years old, and it has been part of popular culture for around thirty years. Compare this to the roughly seventy-five years of television, a hundred years of film, and five hundred years of the printing press. Therefore, video games are a comparatively *new* cultural form, intimately linked to the appearance of computers, postdating literature, cinema, and television. However, if we think of video games as *games*, they are not successors of cinema, print

| Figure 1.3 |
Queen Nefretiry playing senet. Ca. 1250 BC. *Egyptian Expedition of The Metropolitan Museum of Art, Rogers Fund, 1930. (30.4.145)* Photograph ©1978 The Metropolitan Museum of Art.

literature, or new media, but continuations of a history of games that predate these by millennia. The Egyptian board game, senet (figure 1.3), found in the 2686 BC tomb of Hesy-re is a precursor of contemporary backgammon and Parcheesi, games that are commonly played *using computers* today. Therefore, the question is not whether video games are old or new, but how video games are games, how they borrow from non-electronic games, and how they depart from traditional game forms.

But why do we even play games using computer power rather than using other recent inventions such as the telephone, microwave ovens, cars, or airplanes? There appears to be a basic affinity between games and computers: Like the printing press and cinema have historically promoted and enabled new kinds of storytelling, computers work as enablers of games, letting us play old games in new ways, and allowing for new types of games that would previously not have been possible.

Games as Rules

The rules of a game provide the player with challenges that the player cannot trivially overcome. It is a basic paradox of games that while the rules themselves are generally definite, unambiguous, and easy to use, the enjoyment of a game depends on these easy-to-use rules presenting challenges that *cannot* be easily overcome. Playing a game is an activity of improving skills in order to overcome these challenges, and playing a game is therefore fundamentally a learning experience. This takes different forms in different games, but we can outline two basic ways in which games are structured and provide challenges for players: that of *emergence* (a number of simple rules combining to form interesting variations) and that of *progression* (separate challenges presented serially).

Emergence is the primordial game structure, where a game is specified as a small number of rules that combine and yield large numbers of game variations for which the players must design strategies to handle. This is found in card and board games, in sports, and in most action and all strategy games.

Progression is the historically newer structure that became part of the video game through the adventure genre. In progression games, the player has to perform a predefined set of actions in order to complete the game. One feature of the progression game is that it yields strong control to the game designer: since the designer controls the sequence of events, progression games are also where we find most games with storytelling ambitions.

Though games may be different in structure, a player approaches every game with whatever repertoire of skills he or she has, and then improves these skills in the course of playing the game. To play a game is to improve your repertoire of skills, and the challenge of game design is to work with the skill set of the player through the game.

Games as Fiction

Most video games create fictional worlds, but games do this in their own special tentative and flickering way: the hero dies and is respawned moments later; the strategy game lets players "build" new people in a few seconds; the player dies and loads a *save game* in order to continue just before he or she died; in-game characters talk about the game controllers that the player is using. These things mean that the fictional worlds of many games are contradictory and incoherent, but the player may not experience this as such since the rules of the game can provide a sense of direction even when the fictional world has little credibility. In fact, the player's experience of the game fiction appears not to require much consistency—the world of a game is something that the player can often *choose* to imagine at will.

Fiction plays a different role in different games and game genres, and while some players may be thrilled by the fiction of a game, others may dismiss it as unimportant decoration of the game rules. Nevertheless, there is a general scale from the highly replayable multiplayer game (the emergence game) where the player can gradually begin to ignore the fiction to, at the other extreme, the "complete-once" adventure game (the progression game), where the player only faces each setting once and is therefore more likely to take the fictional world at face value.

What a Game Is

In this book, I have tried to examine what (if any) similarities can be found between the majority of the things we call "games," while at the same time being open to considerations of historical change and potential discussion about borderline cases. The *classic game model* presented in chapter 2 is a snapshot of a specific way of creating "games," a model that can be traced historically for thousands of years. The classic game model consists of six features that work on three different levels: the level of the game itself, as a set of rules; the level of the player's relation to the game; and the level of the relation between the activity of playing the game and the rest of the world. According to this model, a game is

1. a rule-based formal system;
2. with variable and quantifiable outcomes;
3. where different outcomes are assigned different values;

4. where the player exerts effort in order to influence the outcome;
5. the player feels emotionally attached to the outcome;
6. and the consequences of the activity are optional and negotiable.

The six features of the model are necessary and sufficient for something to be a game, meaning that all games have these six features, and that having these features is enough to constitute a game. While we can imagine any number of other phenomena that have only some of these features, this specific intersection is uniquely productive, allowing for the huge variation and creativity that we are witnessing in games.

This game model is the basis upon which games are constructed. It corresponds to the celluloid of movies; it is like the canvas of painting or the words of the novel. The game model does not mean that all games are the same, but that with these six features we can talk about how games are different from each other. Additionally, the model does not tie games to any specific medium, and games are therefore *transmedial* in the same way that storytelling is transmedial. Storytelling is a transmedial phenomenon since many different media can tell stories; games are a transmedial phenomenon since many different media (or tools) can be used for playing games.

While video games mostly conform to the classic game model, they also modify the conventions of the classic model. Games *have* changed. So while it makes sense to see games as a fairly well defined form, this book is also about how video games modify and supplement the classic game model; the history of video games is partly about breaking with the classic game model.

The Study of Video Games

This book was born from a brief and turbulent history of video game studies. It is a response to a number of questions that have been raised in numerous conferences, seminars, articles, and discussions over the past few years. It is also a book that does not rest easily with any one tradition, but neither did it appear out of thin air. Rather my work has consisted of collecting pieces from as many different fields and people as possible, while testing my ideas on as many different audiences as I could. As the history of the video game invokes a history of non-electronic games, video game studies must admit a debt to the study of non-electronic games.

Games for Other Purposes

For reasons that escape us, games have lingered under the cultural radar for thousands of years, and most of the commentaries that touch on games have been using *the idea* of games for other purposes.

Famously, the German philosopher Ludwig Wittgenstein used the concept of games[2] for building his philosophy of language, and games were singled out as an exemplary case of something that could not be defined or narrowed down. Games also inspired a theory that discusses a relation between rules and representation: Structuralists such as Vladímir Propp and Claude Lévi-Strauss claimed that meaning or narratives were based on formal structures (Pavel 1986; Propp 1968). Ferdinand de Saussure found chess to be inspirational for linguistics; as he wrote, "a state of the board in chess corresponds exactly to a state of the language. The value of the chess pieces depends on their position upon the chess board, just as in the language each term has its value through its contrast with all other terms" ([1916] 2000, 88). Therefore, the meaning of a chess piece stems from its relation to other pieces in the game, and is independent of its shape or makeup.

Games are usually well structured problems, and this has led to their being used in several other fields. John von Neumann and Oskar Morgenstern's 1944 book on game theory, *Theory of Games and Economic Behavior* (1953), deals primarily with economics, but in a way that has some relevance for the general study of games. Their economic *game theory* uses *games* as a general term for a specific type of problem. Game theory provides a generalized description of different types of *strategies*, and even though its focus is not on "games" that are meant to be enjoyed, it turns out that the formal game theoretical properties can yield important insights into games *and* game playing. For example, a game with a dominant strategy (a strategy that is better than all other strategies) is often *boring* because the player is not challenged in any way.

It is also the well structured character of games that have made them into a stable of artificial intelligence research. In 1950, Claude Shannon proposed using chess as a starting point for developing the modern "general purpose computer":

> The chess machine is an ideal one to start with, since: (1) the problem is sharply defined both in allowed operations (the moves) and in the ultimate goal (checkmate); (2) it is neither so simple as to be trivial nor too difficult for satisfactory solution; (3) chess is generally considered to require "thinking" for skilful play; a solution of this problem will force us either to admit the possibility of a mechanized thinking or to further restrict our concept of "thinking"; (4) the discrete structure of chess fits well into the digital nature of modern computers. (Shannon 1950)

What the development of chess playing programs actually demonstrated was that humans play chess (and solve problems) in many different ways, and usually not as the early chess programs did, which was by considering as many chess positions as possible. In this way, the development of chess programs has been connected to cognitive science, where many studies have been conducted of how humans actually play games. Specifically, Adriaan D. De Groot's (1965) study of chess players looks into the psychology of play rather than the purely strategic aspect of play. Games and game-like problems have been commonly used for studying human problem solving—for example, in the work of Allen Newell and Herbert A. Simon (1972).

Finally, as Marcel Danesi has explored, games and puzzle solving have yielded many mathematical insights and methods. For example, the field of graph theory originates from the mathematician Leonhard Euler's study of the *Königsberg Bridge Problem:* whether seven bridges in the city of Königsberg could be traversed without crossing any bridge more than once (Danesi 2002, 19–22; Weisstein 2004). All of this demonstrates that game-related research has historically mostly been concerned with using games for studying other matters, and the insights reached concerning games have mostly been incidental to this research.

Games for Their Own Sake

In the study of games for their own sake, the field has been widely scattered historically. It probably flourished first in the late nineteenth century around folklore studies, for example in the work of Stewart Culin's 1907 *Games of the North American Indians* (1992), an 800-page collection and categorization of the games of Native Americans. Game studies also flourished around 1970. For example, E. M. Avedon and Brian Sutton-Smith's anthology *The Study of Games*[3] (1971) is an excellent overview of theory on non-electronic games, collecting articles into sections on the history of

games, the usage of games, and the structure and function of games. *The Study of Games* demonstrates that the narrow history of game research has mostly been sociological, anthropological, or philosophical, but not very well developed as an aesthetic field. That is, while much space has been devoted to the study of people (other than the researcher) playing games, very little has been said about the first-person experience of playing a game.

The two classic texts of game studies are Johan Huizinga's *Homo Ludens* (1950) and Roger Caillois's *Man, Play, and Games* (1961). For my purposes here, they suffer from the same problem of covering a broader area than *games* in that both discuss rule-based games as well as free-form play. Johan Huizinga focuses on *play* as a central component of all culture, but provides only sketchy discussions about games as such. Caillois is best known for his categorization of games (and play) into *agôn* (competition), *alea* (chance), *mimicry* (simulation or make-believe), and *ilinx* (vertigo). If anything, Caillois demonstrates that categorizations need to clearly reflect their goals and presuppositions, since in actuality games are not choices *between* chance and competition, or even placed on a scale between them, but rather almost all games are competitive *and* contain varying amounts of chance. It seems more reasonable to describe chance as one single example of a multitude of game design principles (as discussed in chapter 3) on the same level as showing or hiding information, mutual or contradictory goals, etc. Likewise, while *ilinx* (vertigo) is certainly a part of many physical game activities and of many video games, it is but a single example of the infinite number of different types of experiences that a game can give.

A complementary examination of games is provided by Bernard Suits's philosophically oriented dialogue *The Grasshopper* (1978), where a series of game definitions are proposed and discussed. Suits is best known for his description of games as letting the player reach the goal using only the *less efficient means* available. Suits belongs to a tradition of sports philosophy that has grown largely around the *Journal of the Philosophy of Sport*. This book is intended to be less purely philosophical than sports philosophy, but on the other hand more aesthetically oriented than play studies, a field that is often oriented toward the play of children. R. E. Herron and Brian Sutton-Smith's *Child's Play* (1971) provides a good overview of the field, as does Sutton-Smith's *The Ambiguity of Play* (1997).

Video Game Studies

The relatively short history of video games is complemented by an even shorter history of research. It is only around the turn of the millennium that video game studies began to come together as a field with its own conferences, journals, and organizations. This brief history has been something of a gold rush and a race toward being the first to point out special aspects of games, to format the field, to define words, and to point to similarities and dissimilarities between games and other cultural forms. This is not the place for an exhaustive review of the field so far; I will simply relate the discussions to which this book responds.

Video game studies have so far been a jumble of disagreements and discussions with no clear outcomes, but this need not be a problem. The discussions have often taken the form of simple dichotomies, and though they are unresolved, they remain focal points in the study of games. The most important conflicts here are games versus players, rules versus fiction, games versus stories, games versus the broader culture, and game ontology versus game aesthetics.

Games or Players

A basic dichotomy concerns whether we study the games themselves or the players who play them. Economic game theory is arguably originally the study of games as objects unrelated to players, but game theory does not rule out discussion of player experiences—it is just outside the scope of game theory. Still it would be perfectly possible to propose that we look exclusively at the games "themselves," while ignoring the fact that they are played by people. We can then at least imagine the reverse argument that declares the rules of a game unimportant compared to the way they are actually used. Linda Hughes has examined how a group of girls played Foursquare.[4] This turns out to be a combination of official and unofficial rules, conflicting success criteria, and rule negotiations. According to Hughes, "Game rules can be interpreted and reinterpreted toward preferred meanings and purposes, selectively invoked or ignored, challenged or defended, changed or enforced to suit the collective goals of different groups of players. In short, players can take the same game and collectively make of it strikingly different experiences" (1999, 94). This is a convincing argument, and part of a larger point that children's games cannot be meaningfully described only as the rules that make them up. If we took

this argument to a logical extreme, we could claim that the game rules do not matter at all. This argument would unfortunately imply that the children might as well be fencing, playing poker, or playing rugby! A more detailed analysis of Foursquare reveals that the protracted structure of the game, with no clear termination, no final winner, and no clear score count *allows* the players to play while having many other considerations than simply perfecting their own performance. Moreover, the unclearness of some rules such as the rule against slamming[5] makes room for all kinds of social power play. At the same time, the players have *chosen* to play this game rather than other games, and players change the rules because they want to play *this game*, with specific rules. We cannot ignore the role of the rules without ignoring a basic aspect of the player experience: that different games yield different kinds of experiences.

Rules or *Fiction*

The main argument of this book, that video games are rules *and* fiction, is a response to a long history of discussions of whether games were one *or* the other. As in Saussure's observations about chess, it has often been noted that in a board game the actual shape of a piece appears unimportant in relation to the rules. Erving Goffman has proposed a principle called *rules of irrelevance*, meaning that the specific shape of a piece in a game is not important:

> [Games] illustrate how participants are willing to forswear for the duration of the play any apparent interest in the aesthetic, sentimental, or monetary value of the equipment employed, adhering to what might be called *rules of irrelevance*. For example, it appears that whether checkers are played with bottle tops on a piece of squared linoleum, with gold figurines on inlaid marble, or with uniformed men standing on colored flagstones in a specially arranged court square, the pairs of players can start with the 'same' positions, employ the same sequence of strategic moves and countermoves, and generate the same contour of excitement. (Goffman 1972, 19)

Roger Caillois does not deny that games can have fiction, but surprisingly states that games are rules *or* fiction, that rule-based games *do not* have a make-believe element:

> Despite the assertion's paradoxical character, I will state that in this instance the fiction, the sentiment of *as if* replaces and performs the same function as do rules. Rules themselves create fictions. The one who plays chess, prisoner's base, polo, or baccara, by the very fact of complying with their respective rules, is separated from real life where there is no activity that literally corresponds to any of these games. That is why chess, prisoner's base, polo, and baccara are played *for real. As if* is not necessary.... Thus games are not ruled and make-believe. Rather, they are ruled *or* make-believe. (Caillois 1961, 8–9)

The division is, however, contradicted by most modern board games and video games. Most video games are ruled *and* make-believe.

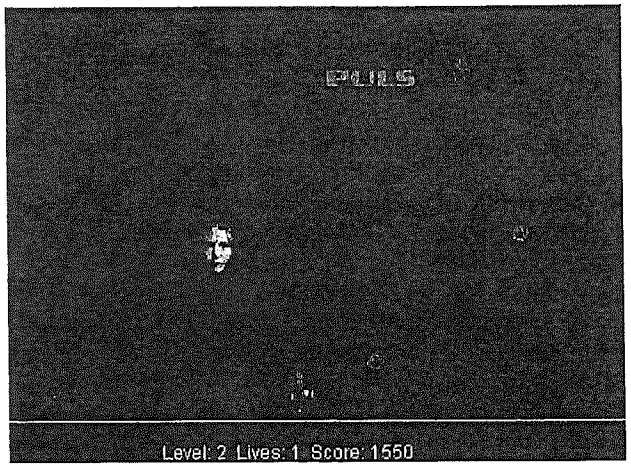
In video game studies, the denial of fiction is an alluring position that I have also previously taken (Juul 1998). It is based on a simple recurring argument that tends to follow this pattern:

1. Rules are what makes a game a game.
2. Fiction is incidental to whether something is a game.
3. A game can be interesting without fiction.
4. A game with an interesting fictional world can be a terrible game.
5. Therefore, fiction in games is unimportant.

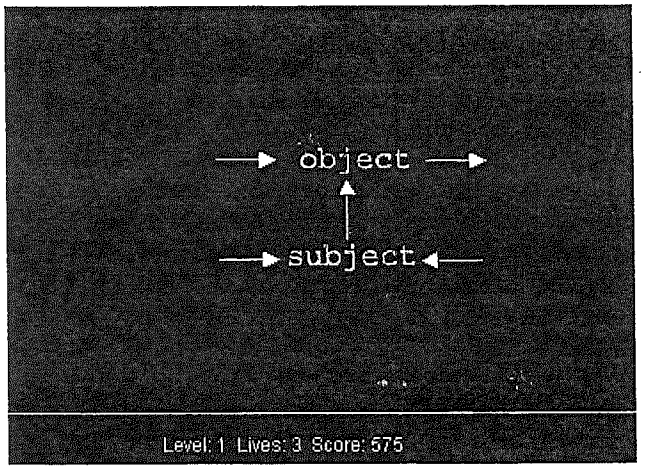
Though the conclusion is tempting, it is also false. Compare these two games based on identical rules (and programming), but with different graphics. In the first game (figure 1.4), the player controls a spaceship in a battle against the heads of the hosts of a television program. In the second game (figure 1.5), the player controls a spaceship in a battle against various theories, in this case a narratological model.

In a 1998 paper, I compared two games based on this program, and my conclusion was as follows: "As you can see, the symbolical or metaphorical meaning of the game is not connected to the program or the gameplay. The relationship is, in a word, *arbitrary*" (Juul 1998).

This idea that the representation of a game is irrelevant appears to have a constant allure, but it also break down upon further scrutiny. The game designer Frank Lantz has provided a similar argument based on design experiences:



| Figure 1.4 |
Puls in Space (Juul 1998a).



| Figure 1.5 |
Game Liberation (Juul 2000).

I began to think about how structure and representation work in games. There was a notion buried in my original idea, the idea of a fundamental separation between a game's structure and whatever subject matter or activity or setting the game represents. The implication was that you could take any number of different structures and match them up with various themes for different effects, but there wasn't any *deep, essential* relationship between any particular theme and any particular game mechanic. . . .

After a couple of months of banging my head against it, this notion seemed less certain, or at least less interesting. . . .

There are, of course, many relationships between theme and structure in a game. Whether or not any of those relationships are *essential*, they are complex and vital enough to resist my attempt to lightly shuffle them around. (Lantz 2004, 310)

This strongly suggests that the relation between rules and fiction in the games in figure 1.4 and 1.5 is *not* arbitrary. Rather, these two games are *satirical*. In the first case they stage the love/hate relationship that viewers may have with television personalities as a deep-space battle. In the second case they stage an academic discussion—defending games against theoretical imperialism—as a deep space battle. Both are based on a background of some existing antagonism—and that is why they work, because the rules fit the representation—in an allegorical way.

Games Telling Stories

The early years of video game studies were often conceived as a discussion between *narratology* (games as stories) versus *ludology* (games as something unique). This discussion tended to alternate between being a superficial battle of words and an earnest exploration of meaningful issues (Murray 1997; Frasca 1999; Juul 1999; Eskelinen 2001b; King and Krzywinska 2002b; Atkins 2003; Aarseth 2004a; Jenkins 2004). Video game studies did not appear in a vacuum, so we need to remember the history that led up to this discussion. While *narratology* originated from Aristotle's *Poetics* and the study of storytelling media such as drama, novels, and films, the concept of *narrative* is today commonly used in a much broader sense. We can speak of a *narrative turn* after which it has become common to see narrative as the primary way in which we make sense of and structure the world. From this perspective, such different things as scientific

discourse, the ideology of a nation, and our understanding of our personal lives are structured in the same way, using narratives. Espen Aarseth (2004a) has criticized this for being an unproductive ideology of *narrativism*. Outside game studies, Thomas Pavel (1986) has called this *mythocentrism*. The description of games as storytelling systems often overlaps with the prescriptive idea that video games (or "interactive narratives") would be *better* if they were more like stories. Building on Aristotle, Brenda Laurel (1986) has proposed a system for generating well formed plots. In this system, the computer program must take on the role of an author while the game progresses and make sure that regardless of the player's actions, every game session becomes well formed. Janet Murray's book *Hamlet on the Holodeck* (1997) describes the similar utopia of a *holodeck*—a completely immersive and transparent environment in which a user/player can engage in a well formed story. While this is in itself an overwhelming technical challenge, the logical problem is that there is no compelling argument demonstrating that a well formed "narrative" would be a more interesting *player* experience.[6]

Ludology is broadly taken to mean "the study of games." The history of the word itself is something of a mystery—its earliest known usage is from 1982 (Csikszentmihalyi 1982). *Ludology* was probably popularized by Gonzalo Frasca's 1999 article "Ludology Meets Narratology." I first used it in my paper "What Computer Games Can and Can't Do" (Juul 2000). From the outset, ludology has often been perceived as focused on distancing itself from narratology, and as trying to carve out video game studies as a separate academic field.

Some more recent theory has tried to stake something of a middle ground where the unique qualities of games are not denied, but the function of fiction or story in a game can still be discussed. In Rune Klevjer's paper "In Defense of Cutscenes" (2002), he criticizes "radical ludology" for completely dismissing cut-scenes (cinematic intermissions in games), and argues that cut-scenes serve several positive functions: they provide a unifying logic for the game and rewards for the player's actions. Additionally, Wibroe, Nygaard, and Andersen's article "Games and Stories" (2001) offers a nuanced discussion of game-story relations.

From the other end of the spectrum, Geoff King and Tanya Krzywinska (2002a) have discussed the relationship between games and cinema as a complex relationship with synergy and mutual inspiration as well as some

notable differences. As an attempt at bridge-building between the open structure of games and the closed structure of stories, the concept of *quests* has been proposed by Ragnhild Tronstad (2001), Espen Aarseth (2004b), and Susana Tosca (2003). Quests in games can actually provide an interesting type of bridge between game rules and game fiction in that the game can contain a predefined sequence of events that the player then has to actualize or enact. This is discussed as a *progression* structure in chapter 3, and the relation between games and stories is discussed at the end of chapter 4.

Games or the Broader Culture

In a broader perspective, Henry Jenkins (2003) sees video games as part of a bigger complex of *transmedia storytelling*, where content can move between different media. In this broad sense of storytelling, video games *are* part of a general ecology of transmedia storytelling, but on a level that is often closer to the level of toys and merchandising than to the level of movies or novels. Realistically, video games are to some degree part of a general *storytelling ecology*, incorporating at least some elements of popular stories.

Just as we can choose to discuss games or players, we can also choose between studying a specific game for its role in the general media ecology or focusing on the game itself and the playing of the game. There is no reason to commit ourselves to one side of the discussion.

The added perspective in this book is that video games are also part of a general *game ecology*, where the video game incorporates other kinds of games and inspires other types of games.

Game Ontology or Game Aesthetics

We can also choose to discuss what video games *are* (ontology) or what they *should be* and what makes them enjoyable (aesthetics). In practice, this can be quite muddled: The video game researcher is usually (and arguably should be) a big fan of video games, and hence the game researcher enters the field with preferences for specific types of games, and the selection of games influences the researcher's arguments.

The extreme version of this is the game review, written with the explicit purpose of evaluating the quality of a game. I will be quoting reviews from several sources in order to discuss the relative merits of different

games and different ways of structuring games. Game reviews provide documentation about the informal vocabulary that is used in the video game community. It is worth remembering that terminology is continually developed and discussed outside academia, and that this, too, is worthy of attention.

One issue is to what extent game research should deal with game design. The game development community has in recent years produced a large body of interesting books and articles. Chris Crawford's seminal *The Art of Computer Game Design* (1982) is an early discussion of video game design, but for the purpose of this book, more relevant discussions can be found in Richard Rouse's *Game Design—Theory and Practice* (2001) and Andrew Rollings and Dave Morris's *Game Architecture and Design* (2000). Game development writings cover a variety of different subjects including programming, artificial intelligence, 3-D graphics modeling, 3-D texturing, sound, music, team building, team management, as well as what is closest to my focus, game design. I will refer to a number of articles and presentations from *Game Developer Magazine*, *Gamasutra*, and the annual Game Developers' Conference.

If game design and game research often fall into separate camps, Katie Salen and Eric Zimmerman's book *Rules of Play* (2004) is a good example of how they can overlap. Working on the three levels of rules, play, and culture, Salen and Zimmerman describe games from a multitude of perspectives using examples of many games commissioned for the book. For various historical reasons, it is tempting to choose between being theoretical or practical, and while the present book is primarily theoretical, it is meant to be at least compatible with practical work on games.

Fun in Theory

When we are theorizing about games, it can seem that games contain a built-in contradiction: Since play is normally assumed to be a free-form activity devoid of constraints, it appears illogical that we would choose to limit our options by playing games with fixed rules. Why be limited when we can be free? The answer to this is basically that games provide context for actions: moving an avatar is much more meaningful in a game environment than in an empty space; throwing a ball has more interesting implications on the playing field than off the playing field; a rush attack is only possible if there are rules specifying how attacks work; winning the game

requires that the winning condition has been specified; without rules in chess, there are no checkmates, end games, or Sicilian openings. The rules of a game add *meaning* and *enable actions* by setting up *differences* between potential moves and events.

Likewise, a game for multiple players is nominally a *limitation* of what the players are allowed to do, but it is a limitation that provides an occasion for interesting social interaction. When it is sometimes suggested to be a problem that games are competitive, it is a basic misunderstanding of how a game works: The conflict of a game is not antisocial; rather it provides a context for human interaction. Controlling a character that hits a character controlled by another player does not mean that one wants to attack that other person in real life: It means that one enters a complex world of symbolic interactions where attacking someone in a game can be an invitation to friendship, and helping someone in the same game can be a condescending rejection. In a game, things are not what they seem. Humans are not always literal in their interactions, and we cannot take human games at face value. Competitive games are social affairs, and much more so than the rarely played non-competitive games that have been proposed.[7]

Why are video games fun? One idea states that the all-important quality factor of a game is its *gameplay*, the pure interactivity of the game. In other words, that the quality of a game hinges on its rules, on the game-as-rules rather than on the game-as-fiction. In the words of Sid Meier, designer of *Civilization* and other classics, a *game is a series of interesting choices* (Rollings and Morris 2000, 38), by which Meier means that high-quality games are the ones whose choices provide high-quality mental challenges for players. While this is a compelling idea, a closer examination reveals many games that are considered enjoyable even though they do not provide any mental challenges. I believe that there is ultimately no one-sentence description of what makes all games fun; different games emphasize different types of enjoyment and different players may even enjoy the same game for entirely different reasons.

By analogy, James Cameron's movie *Titanic* (1997) contains a historical element, the spectacle of a big ship crashing into an iceberg, political commentary on class societies and gender roles, dramatic action where we follow an escape from the ship as it sinks, a hit title song, and, of course, a love story. Different viewers may enjoy the film for different

reasons, and one viewer may enjoy the action sequence while disliking the hit song, while another viewer may like the love story and the hit song, but dislike the action sequence. Part of the audience may simply be in the theater because the people they were with wanted to go. Any popular cultural object or pastime can be popular for several different reasons at the same time.

Fortunately, this does not prevent us from discussing game enjoyment in more detail. The idea of what makes a game enjoyable may change over time and things that were once considered dull obstacles to the player's enjoyment can be foregrounded and become the central focus of a new game. Arguing about the rules of a game is often considered a problem, but it can also be enjoyable in its own right. Though a game generally maintains some consistency in the kinds of challenges it presents to a player, it is also possible to enjoy a game because the challenges it presents are inconsistent. And even though games usually let players perform actions that they can not perform in real life, it is, for example, possible to make a popular game like *The Sims* (Maxis 2000) that involves mundane tasks such as cleaning a house.

The Cultural Status of Games

Video games are notoriously considered lowbrow catalogues of geek and adolescent male culture. While this is not the whole picture, there is some extent to which the settings of many games can be somewhat unimaginative and where the actions that the players can perform tend to be simple. Video games generally focus on manipulating and moving objects, and less commonly address the more complex interactions between humans such as friendships, love, and deceit. We can suggest many reasons why this is so—we can blame unimaginative game designers; we can blame a conservative game audience; we can blame a risk-averse game industry; and finally we can look at game design and see that the game form lends itself more easily to some things than to others—it is *hard* to create a game about emotions because emotions are hard to implement in rules.

While games are regularly considered lowbrow, this is often due to some very naïve notions of what is highbrow or what is *art*. In a very simple view of art, art is what is ambiguous, whereas most games tend to have clear rules and goals. As Immanuel Kant would have it, art is *without interest*, whereas game players clearly play with *much* interest and probably send the wrong signals simply because they *look* completely unlike visitors to an art gallery. We cannot reasonably use such claims as checklists, and we should avoid thinking about art, and games, in a limited and unimaginative way.

It should also be clear that playing a game does not imply literally endorsing the actions in the game or wanting to perform them in real life. This book is not about violence in games, but followers of the discussion may find it interesting to consider what a game is or what role the fictional world of a game plays. There are certainly strong arguments in favor of seeing the fictional worlds of games as just that, *fiction*. In a historical perspective, the current preoccupation with the assumed dangers of video games is a clear continuation of a long history of regulation of *games* as such: For example, in 1457 golf was banned in Scotland because it was felt that it kept young men from practicing archery (Avedon and Sutton-Smith 1971, 24). Pinball machines were banned in New York City from the late 1930s to 1976 (Kent 2000, 72). The Australian Office of Film and Literature Classification refused to classify *Grand Theft Auto III* (Rockstar Games 2001), making it illegal to sell it in Australia (IGN.com 2001). Video games were accused of being the reason for the Columbine high school shootings in the United States (Jenkins 1999). Perhaps games have always had the appearance of an uncontrollable activity with unclear and double meanings, and this is why they continue to be targets of regulation.

I do not see any particular contradiction between enjoying an action game and enjoying the poetry of Rainer Maria Rilke. There are a number of historical reasons why we might be tempted to see these things as incompatible, but they are basically misunderstandings. There is nothing inherent in video games that prevents them from ultimately becoming and being accepted as high art, even if this may take some time.

About This Book

The methods chosen in this book are intended to be non-exclusive. A method can easily preclude other methods of investigations, but the present investigation is meant to be at least *compatible* with empirical studies, game design, sociology, film theory, and more. I have attempted to be open about the status of different discussions and definitions, and I have tried to avoid preference for any specific type of conclusion.

In addition to this introduction, the book has five parts.

Chapter 2 presents a *classic game model;* this model was inspired by a number of previous writers on games. The model describes how games have been constructed in a specific historical period, while allowing for the possibility that video games have developed beyond this older model.

Chapter 3, on rules, attempts to combine a former understanding of game rules with a focus on the experience of playing games. In order to describe games as rule-based systems, I draw on computer science and the sciences of complexity. To describe the player's use and experience of the rules of a game, I draw on Marcel Danesi's writings on puzzles (2002), some game design theory, and some cognitive science.

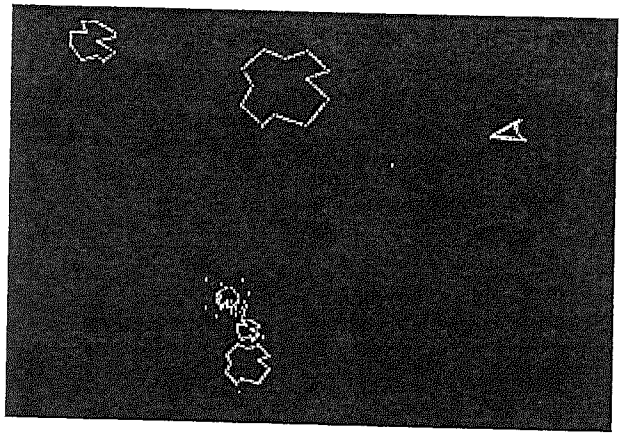
The goal of chapter 4, on fiction, is to provide an account of the fictional aspect of games, an account that covers the spectrum from abstract games to games with incoherent fictional worlds to games with detailed fictional worlds. To be able to discuss this spectrum, the theory of *fictional worlds* is employed.

Chapter 5, on rules and fiction, is the synthesis of the two perspectives of rules and fiction and discusses their interactions using multiple examples.

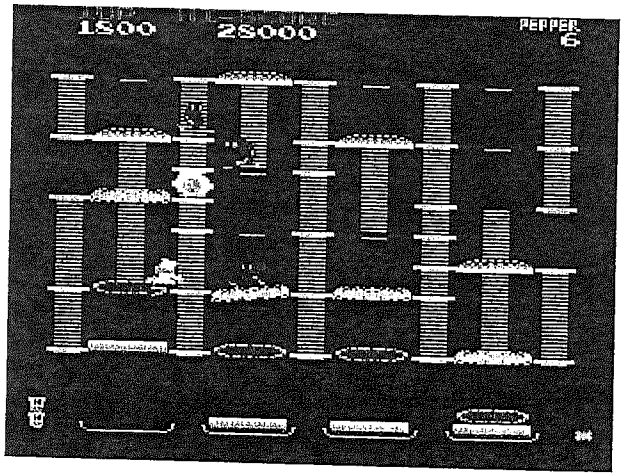
Chapter 6 sums up the points of the book and provides some further perspectives.

| 2 |
VIDEO GAMES AND THE CLASSIC GAME MODEL

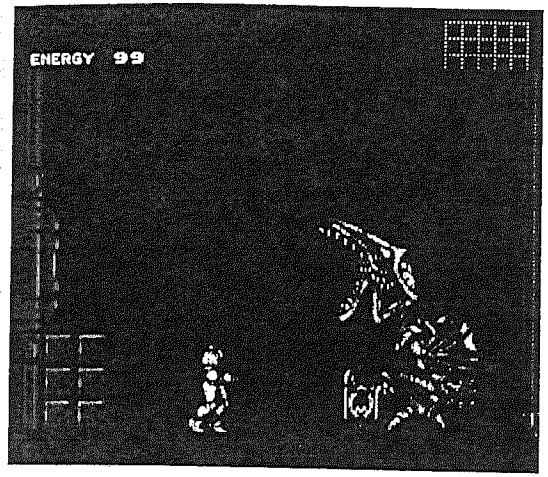
The eight games in figures 2.1–2.8 look to be quite different: One might be tempted to conclude that they have nothing in common and that their sharing the term "games" is an insignificant linguistic coincidence. In the words of Ludwig Wittgenstein, "What is common to them all?—Don't say: 'There *must* be something common, or else they would not be all called "games"'—but *look* and *see* whether there is anything common to all" ([1953] 2001, 27). Indeed, this is the subject of this chapter. Building on seven game definitions by previous writers, I create a new game definition that I call the *classic game model.*[1] The model is *classic* in the sense that it is the way games have *traditionally* been constructed. It is also a model that applies to at least a 5,000-year history of games. Although it is unusual to claim that any aspect of human culture has remained unchanged for millennia, there are strong arguments for this. In the introduction, I mentioned the Egyptian board game of senet, which appears to be a precursor of contemporary games such as backgammon and Parcheesi (Piccione 1980). Additionally, the board and card games developed during the past few thousand years commonly have a shared European-African-Asian history, and the American anthropologist Stewart Culin has documented the games of the North American Indians (Culin 1907). This means that games following the classic game model have been known in the vast majority of human cultures.[2] While many definitions of games have been attempted, the one I will propose here has the goal of explaining what relates video games to other games and what happens on the borders of games. What should the definition look like? We are probably interested in understanding the properties of the games themselves (the artifact designed by the game developers), how the player interacts with them, and what it means to be playing rather than, say, working. So let



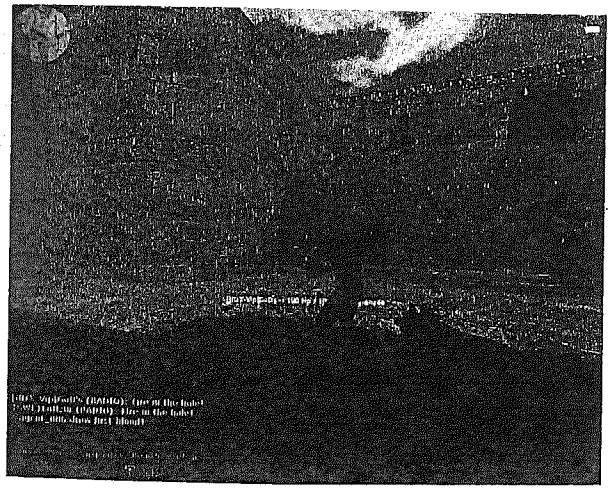
| Figure 2.1 |
Asteroids (Atari 1979).

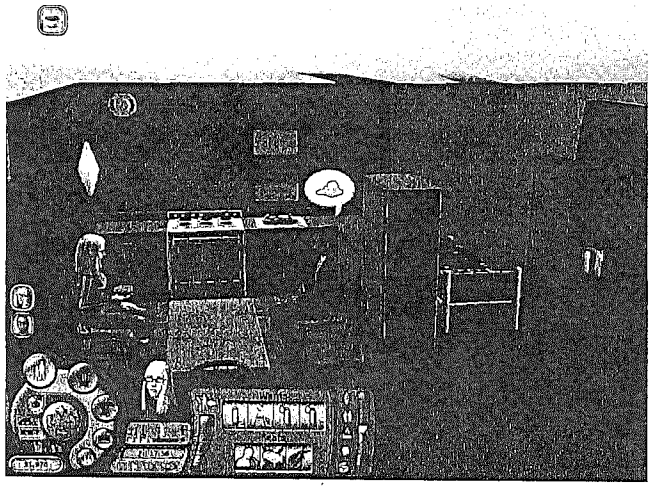


| Figure 2.2 |
Burger Time (Data East 1982).



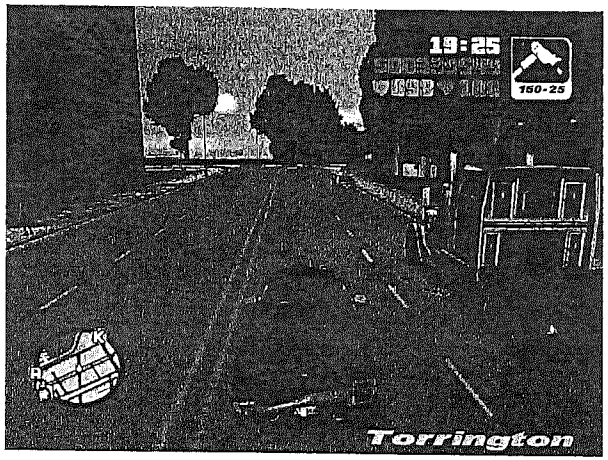
| Figure 2.3 |
Super Metroid (Nintendo 1993).



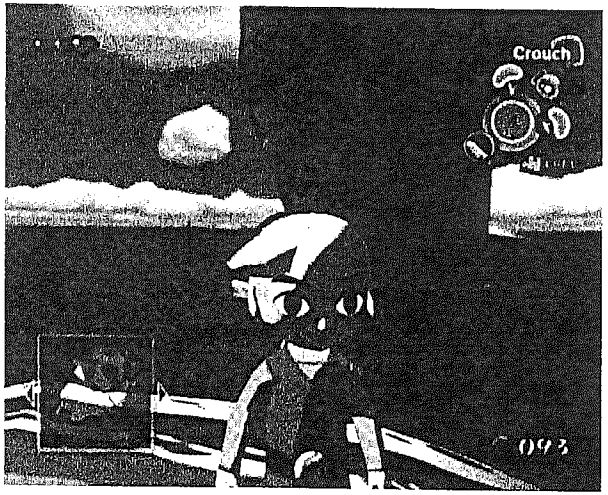


| Figure 2.5 |
The Sims 2 (Maxis 2004).

| Figure 2.6 |
Super Monkey Ball 2 (Amusement Vision 2002).



| Figure 2.7 |
Grand Theft Auto III (Rockstar Games 2001).



| Figure 2.8 |

us assume that a good definition should describe these three things: (1) the system set up by the rules of a game, (2) the relation between the game and the player of the game, and (3) the relation between the playing of the game and the rest of the world.

As demonstrated by Bernard Suits (1978), the simplest way to test a game definition is to test it for being either too broad or too narrow. To set up the test before the definition, I will assume that *Quake III Arena* (ID Software 1999), *Dance Dance Revolution* (Konami 2001), checkers, chess, soccer, tennis, and Hearts are games; that open-ended games such as *The Sims* (Maxis 2000) and *SimCity* (Maxis 1989), gambling, and games of pure chance are borderline cases; and that traffic, war, hypertext fiction, free-form play, and ring-a-ring o' roses[3] are not games. The definition should be able to determine what falls inside from what falls outside the set of games, but also to explain in detail why and how some things are on the border of the definition. The existence of borderline cases is not a problem for the definition as long as we are able to understand *why* and *how* something is a borderline case.

In the big perspective, practically every single game found in any compilation of traditional card games, board games, or sports falls squarely within the classic game model I describe here. It appears that it is only during the last third of the twentieth century that new game forms have challenged the classic model.

Like the fact that mentioning the rules of a game can make it sound dull, the idea of a definition may sound limiting but it is really the opposite. In fact, to define games is to create what Douglas Hofstadter (1985) has termed a *productive set*. An example of a productive set is the set of all shapes that represent the letter *A*, where the mere description of the properties of the set help show how the set can be expanded. Having described all possible *A*'s makes it much easier to come up with new typographical designs for the letter *A*. Having a definition of games also points to how we can create new kinds of "games" that try new things that games have not tried before. It is easier to break the rules once you are aware of them.

The Language Issue

The first thing to note is that it may be easy to accept that there is a difference as well as a close relation between *play* and *game*.[4] *Play* is mostly taken to be a free-form activity, whereas *game* is a rule-based activity.

The problem is that this distinction is very dependent on the language used, and much confused by the fact that in French, Spanish, or German, neither *jeux*, *juego*, or *Spiel* has such a distinction. In English, this is also a bit muddled since "play" is both a noun and a verb (you play a game), whereas "game" is mostly a noun. In English, it is common to see *games* as subset of *play*. Scandinavian languages have a stronger distinction with *leg* = play and *spil* = game with verbs for both—you can play play (*"lege en leg"*) and game game (*"spille et spil"*), so to speak. When writing about games in Danish, it is therefore not self-evident that games are a subset of play, whereas while writing about *Spiel* in German, it is not obvious that one should distinguish between games and play from the outset. This manifests itself with the English translations of writers such as Ludwig Wittgenstein and Roger Caillois who write in languages with no clear play/game distinctions.[5] At the same time, even within the English language, our focus is not on the letter sequence g-a-m-e, since we probably consider big *game* hunting to be a slightly different thing. To clarify, the focus here is on the set of games that we can describe as *rule-based games*.

Some Previous Definitions

Let us go through some previous definitions of games, focus on their similarities and point to any modifications or clarifications needed for our current purpose. First, we should note that the definitions do not necessarily try to describe the same aspect of games: Some concentrate purely on the game as such, some on the activity of playing a game. Additionally, it turns out that many things can be expressed in different ways. When one writer talks about goals and another discusses conflict, it is possible to translate between them: conflict entails (conflicting) goals; the notion of goals entails the possibility of not reaching the goal, and thereby a conflict. We will get back to this, but let us simply list seven game definitions, which we will categorize afterward (table 2.1).

There are more similarities than differences in these definitions. If we want to look at games on three different levels, we can sort the points of the individual definitions according to what they describe. For example, "rules" describes games as formal systems. That a game is "outside ordinary life" describes the relationship between the game and the rest of the world. That a game has an "object to be obtained" describes the game as a

Table 2.1
Seven game definitions

Source	Definition
Johan Huizinga 1950, 13.	[...] a free activity standing quite consciously outside "ordinary" life as being "not serious," but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.
Roger Caillois 1961, 10–11.	[...] an activity which is essentially: free (voluntary), separate [in time and space], uncertain, unproductive, governed by rules, make-believe.
Bernard Suits 1978, 34.	To play a game is to engage in activity directed towards bringing about a specific state of affairs, using only means permitted by rules, where the rules prohibit more efficient in favor of less efficient means, and where such rules are accepted just because they make possible such activity.
E. M. Avedon and Brian Sutton-Smith 1971, 7.	At its most elementary level then we can define a game as an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome.
Chris Crawford 1982, chapter 2.	I perceive four common factors: representation ["a closed formal system that subjectively represents a subset of reality"], interaction, conflict, and safety ["the results of a game are always less harsh than the situations the game models"].
David Kelley 1988, 50.	[...] a game is a form of recreation constituted by a set of rules that specify an object to be attained and the permissible means of attaining it.
Katie Salen and Eric Zimmerman 2004, 96.	A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.

formal system *and* the relationship between the player and the game. If we allow ourselves to translate between different points, seeing for example "goals" and "conflict" as different ways of expressing the same concept, we can group all the points of the definitions according to the level(s) they describe: the game as a formal system, the player and the game, and the game and the rest of the world (table 2.2).[6]

The definitions have many overlaps, but with some work, it is possible to separate the actual disagreements from mere differences in wording.

Rules and Outcomes

All writers agree that games are rule-based (Crawford calls this a "formal system"). While there are many things to say about rules (see chapter 3), let us for the time being focus on the fact that rules are designed to be above discussion—it is supposed to be clear whether a given action is or isn't allowed by the rules of a game.

The question of outcomes is more interesting: It is a salient feature of games that they have variable outcomes—if the outcome is the same every time, it does not qualify as a game. The variability of the outcome follows from Crawford's mention of conflict (only one side can succeed).

Salen and Zimmerman's contribution (2004) here is to point out that the outcome of a game shares some features with the rules of the game: the outcome of a game is quantifiable, meaning that it—like the rules—is designed to be above discussion.

Goals and Conflict

Only Bernhard Suits talks explicitly about goals (a specific state of affairs to be brought about) but goals are implicit in Salen and Zimmerman and Crawford's *conflict*—a conflict presupposes mutually contradicting goals between two entities or, in a broader sense, between a player and the difficulty of reaching a goal. As we will see later, a game without a goal is a borderline case.

Voluntary

Roger Caillois claims that games are voluntary. The problem is that it is quite unclear what this means. Is it not a game if social pressure forces the player to play? Because human motivation is too complex to be simply explained in terms of its being voluntary/involuntary, I believe that it is

Table 2.2
Game definitions compared

	The game as formal system	The player and the game	The game and the rest of the world
Rules Fixed rules (Huizinga) Rules (Caillois) Rules (Suits) Procedure and rules (Avedon and Sutton-Smith) Formal system (Crawford) Rules (Kelley) Rules (Salen and Zimmerman)	■		
Outcome Uncertain (Caillois) Disequilibrial outcome (Avedon and Sutton-Smith) Changing Course (Kelley) Quantifiable outcome (Salen and Zimmerman)	■		
"Goals" Bringing about a state of affairs (Suits) Opposition (Avedon and Sutton-Smith) Conflict (Crawford) Object to be obtained (Kelley)	■	■	
Interaction Interaction (Crawford)	■	■	
Goals, rules, and the world Artificial conflict (Salen and Zimmerman)	■	■	■
"Separate" Outside ordinary life/proper boundaries (Huizinga) Separate (Caillois) No material interest (Huizinga) Unproductive (Caillois)			■

Table 2.2
(continued)

	The game as formal system	The player and the game	The game and the rest of the world
"Not work" Free/voluntary (Caillois) Voluntary control systems (Avedon and Sutton-Smith) Recreation (Kelley)			■
Less efficient means Less efficient means (Suits)			■
Social groupings Promotes social groupings (Huizinga)			■

not possible to meaningfully describe whether games are voluntary or not. However, it could be said that games are primarily autotelic; that is, they are mostly used for their own sake rather than for an external purpose. It is very hard to set this up as a clear criterion—the game definition I am proposing at least partly explains *why* games are such that this issue cannot be settled.

Separate and Unproductive

In Johan Huizinga's description, play is an activity that has "no material interest, and no profit can be gained from it" (1950, 13). Roger Caillois points out that this leaves no place for gambling and suggests that in games, "Property is exchanged, but no goods are produced" (1961, 5).

Both Huizinga and Caillois describe games as being outside "normal" life: They are assigned a separate space and separate time. In Huizinga's description, games take place inside a *magic circle*, outside which the game does not apply. There are some obvious objections and counterexamples to this description—I will return to this.

Less Efficient Means

Bernard Suits famously describes games as permitting players to use only the "less efficient means" in order to reach the goal (Suits 1978, 34). I will

contend that this description is interesting but ultimately misleading. Suits's argument hinges on the fact that it is (mostly) possible to describe a game as the effort to reach what he calls a *pre-lusory goal,* a goal which can be said to exist independently of the game, and that there is always an optimal but disallowed way of reaching this goal. This idea is in itself quite problematic.[7] The concept of inefficient means makes sense in Suits's prime examples of the race where it is not allowed to cut across the infield and the high jump where using a ladder is disallowed. The problem is that it would always be possible to set up a game using the *most* efficient means possible: a racing game where cutting over the infield was allowed; a race to climb a ladder, etc. And the concept of less efficient means completely breaks down in the case of video games. In *FIFA 2002* (a soccer game) (Electronic Arts 2002) and *Virtua Tennis* (Hitmaker 2000), the video games are much easier to master than their real-life professional counterparts are—namely, soccer and tennis. If we look at *any* video game, how can we say that the player is using less efficient means? Would this be compared to making the game yourself? Hacking the game? Using a cheat code?

Bernard Suits's definition is exemplary in that it shows how a feature of a definition can be alluring, in this case not because "less efficient means" is actually part of what makes a game a game, but because it *entails* some other features that are important, namely some player effort, some kind of separation of the game from the rest of the world, and some element of acceptance of the rules—in a way, Suits hints at the characteristic of games being *voluntary*.

Fiction

As already discussed, the issue of fiction depends much on the games discussed. *Some* games have a fictional element, but this is not universal to games. I discuss fiction in chapter 4 of this book.

Social Groupings

Since some games are solitary, social groupings are not a universal aspect of games, but game rules and social groupings interplay—a group may form around the playing of a specific game, and an existing group may decide to play a game. The way a game can build community is discussed in chapter 3.

The Game and the Player: A Second Look at Goals

The list of examples gives us two border case examples of the concept of goals: *The Sims* and *SimCity* are often labeled games even though they do not have explicit goals. While the game designer, Will Wright, claims that they are not games but toys (Costikyan 1994), they are nevertheless often categorized as "video games." The proposal here is to be more explicit about the player's relation to the game by dividing the concept of *goals* into three distinct components, namely:

1. Valorization of the possible outcomes: Some outcomes are described as positive, some as negative.
2. Player effort: The player has to *do* something.
3. Attachment of the player to an aspect of the outcome: The player agrees to be happy if he or she wins the game, unhappy if he or she loses.

Separate and Unproductive: Negotiable Consequences

In Roger Caillois's definition, games are *separate* in time and space from the rest of the world and *unproductive*. It is fairly easy to find examples of games that transgress the first aspect: It is after all possible to play chess by mail, in which case the game overlaps with daily life, both in the sense that the time span of the game overlaps a non-game part of life and in the sense that it is possible to consider the moves one wants to play while going about one's daily business. Likewise, many Internet-based strategy games stretch over months or even years. The second feature, *unproductive*, is dubious if productivity can mean something other than the production of physical goods. Caillois's suggestion is that gambling does not *produce* anything. From an economic viewpoint, this is problematic since gambling is a huge industry. Also note that it is possible to bet on the outcome of any game,[8] and that many people do make a living playing games.

Separation is a special issue in live action role-playing games (games where players typically dress up as characters to play the game), where the games may be played in spaces also used for "normal life." In these cases, specific descriptions have to be made as to what interactions are allowed between non-playing people and players.[9]

Taking a step back, we can see that the notions of games being *separate* and *unproductive* are quite similar in two respects. Both specify what

interactions are possible (and allowed) between the game activity and the rest of the world, and neither are perfect boundaries, but rather fuzzy areas under constant negotiation.

When Caillois claims that a game played involuntarily is not a game, there is a distinction between a given game and a given playing of a game. All copies of a given title do not suddenly cease to be games because someone is making money playing them. Since all games are potential targets for betting and professional playing, I suggest that games are characterized as activities with *negotiable consequences*. A specific playing of a game may have assigned consequences, but games are characterized by the fact that they can be assigned consequences on a per-play basis. That games carry a degree of separation from the rest of the world is entailed in their consequences being negotiable.

A New Definition: Six Game Features

From this, the game definition I propose has six features:

1. *Rules:* Games are rule-based.
2. *Variable, quantifiable outcome:* Games have variable, quantifiable outcomes.
3. *Valorization of outcome:* The different potential outcomes of the game are assigned different values, some positive and some negative.
4. *Player effort:* The player exerts effort in order to influence the outcome. (Games are challenging.)
5. *Player attached to outcome:* The player is emotionally attached to the outcome of the game in the sense that a player will be winner and "happy" in case of a positive outcome, but a loser and "unhappy" in case of a negative outcome.
6. *Negotiable consequences:* The same game [set of rules] can be played with or without real-life consequences.

In short form:

A game is a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome, and the consequences of the activity are negotiable.

Table 2.3
The classic game model and the game, the player, the world

	The game as formal system	The player and the game	The game and the rest of the world
1. Rules	■		
2. Variable and quantifiable outcome	■		
3. Value assigned to possible outcomes		■	
4. Player effort	■	■	
5. Player attached to outcome		■	
6. Negotiable consequences			■

In diagram form, the new definition can be visualized as six features, spanning the three categories of the game, the player, and the world (table 2.3). Features 1, 2, and 4 describe the properties of the game as a formal system; 3 describes the values assigned to the possible outcomes of the system—the goal that the player must strive for; 4 and 5 describe the relation between the system and the player (feature 4 describes both the fact that the game system can be influenced by player input and that the player does something); 6 describes the relation between the game activity and the rest of the world. Each of these features can be elaborated.

1. Rules

Games have rules. The rules of games have to be sufficiently well defined that they can be either programmed on a computer or that players do not have to argue about them every time they play. The playing of a non-electronic game is an activity that in itself involves trying to remove any lack of clarity in the game rules: If there is disagreement about the rules of a game, the game must be paused until the disagreement has been solved. In a commercial non-electronic game, the developer will

(hopefully) have made sure that the rules are unambiguous, but what about non-commercial games? A non-electronic and "folk" (non-commercial) game tends to drift toward becoming unambiguous. This explains some of the affinity between games and computers—and the fact that a several thousand-year-old non-electronic game is easily implementable in a computer program: The drive toward definiteness in the rules makes the game ripe for implementation in a programming language.

The rules of any given game can be compared to a piece of *software* that then needs *hardware* to actually be played. In the case of games, the hardware can be a computer, mechanical devices, the laws of physics, or even the human brain.

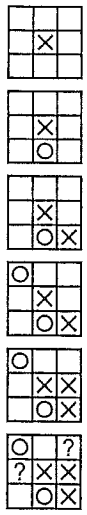
Even if the rules are unambiguous, the game activity still requires that the players *respect* the rules. Bernard Suits has described this as *lusory attitude* (1978, 38–40)—the player accepts the rules because they make the game activity possible. Even a cheater depends on the rules to be able to play.

2. *Variable, Quantifiable Outcome*

For something to work as a game, the rules of the game must provide different possible outcomes. This is straightforward, but for a game to work as a game *activity*, the game must also match the skill of the player(s). Consider the game of tic-tac-toe in figure 2.9.

This is a general property of tic-tac-toe: if your opponent begins by placing a piece in the middle, you must *always* place your first piece in the corner, otherwise you will lose to a reasonably intelligent opponent. This explains why tic-tac-toe is a children's game, and this is where we find that there is a subjective aspect to games. Tic-tac-toe remains interesting as long as it is mentally challenging, but once the players figure out a perfect strategy, they will achieve a draw every time they play. Variable outcome therefore depends on who plays the game. If players always achieve a draw or if a master player continually wins against a beginner, it is still a game, but the players are unable to use it as a game *activity*.

Many games have features for ensuring a variable outcome. Go, golf, or fighting games like *Tekken 3 Tag Tournament* (Namco 2000), allow for handicaps for the players in order to even out skill differences. A few racing games cheat to even out the skill differences between players: In *Gran Turismo 3: A-Spec* (Polyphony Digital 2001), players who are trailing behind on the racetrack automatically drive faster than the leading players, allowing them to catch up.



1. X places in the middle.
2. O places in the bottom middle.
3. X places in the bottom right corner.
4. O has no choice but to block the top left.
5. X places in the middle right square, and thereby threatens on two squares simultaneously (left middle, top right).
6. At this point, O has lost because the first move (bottom middle) was a mistake.

| Figure 2.9 |
A game of tic-tac-toe.

Likewise, players themselves may feign ineptitude in order to bring some uncertainty to the outcome—the *Tekken 3* player may play slightly unfocused; the race game player may simply drive slowly or even reverse the car, the chess player may try especially daring strategies. We may term this *player-organized criticality*—in the same way that players try to uphold the rules, players may also try to ensure suspense about the outcome of the game.

Finally, quantifiable outcome means that the outcome of a game is designed to be beyond discussion, meaning that the goal of *Pac-Man* (Namco 1980) is to get a high score, rather than to "move in a pretty way."[10] Since playing a game where the participants disagree about the outcome is rather problematic, the specification of the outcome develops like the rules of a game, toward becoming unambiguous.

3. Valorization of Outcome

Valorization means that some of the possible outcomes of the game are *better* than others. In a multiplayer game, the individual players are usually assigned conflicting positive outcomes (this is what creates the conflict in a game).

The values of the different outcomes of the game can be assigned in different ways: by a statement on the box ("Defend the Earth"); by instructions of the game; by the fact that some actions give a higher score than others; by virtue of there being only one way of progressing and making something happen; or it can be implicit from the setup—being attacked by hostile monsters usually means that the player has to defend himself or herself against them.

Positive outcomes are usually harder to reach than negative outcomes—this is what makes a game challenging. A game where it is easier to reach the positive outcome than to not reach it would likely not be played much.

4. Player Effort

Player effort is another way of stating that games are challenging, or that games contain a conflict. It is a part of the rules of most games (except in games of pure chance) that the players' actions can influence the state of the game and the game's outcome. The investment of player effort *tends* to lead to an attachment of the player to the outcome, since the investment of energy into the game makes the player (partly) responsible for the outcome. The challenge of games and the player's effort are examined in chapter 3.

5. Player Attached to Outcome

The emotional attachment of the player to the outcome is a psychological feature of the game activity. A player may feel genuinely happy if he or she wins, and unhappy if he or she loses. Curiously, this is not just related to player effort: a player may still feel happy when winning a game of pure chance. As such, attachment of the player to the outcome is a less formal category than the previous ones in that it depends on the player's attitude toward the game. The spoilsport is one who refuses to seek enjoyment in winning, or refuses to become unhappy by losing.

6. Negotiable Consequences

A game is characterized by the fact that it can *optionally* be assigned real-life consequences. The actual assignment can be negotiated on a play-by-play, location-by-location, and person-to-person basis. So while it is possible to bet on the outcome of any normally "for-fun" game, it is impossible to enter a casino in Las Vegas and play without betting money.

If a player loses a game and faces horrible consequences from this, conforming to the negotiated outcome is then a question of honor. In the work *Germania*, the Roman historian Tacitus (ca. AD 56–ca. AD 120) is surprised at how absolutely the Germanic people respect this: "Gambling, one may be surprised to find, they practise in all seriousness in their sober hours, with such recklessness in winning or losing that, when all else has failed, they stake personal liberty on the last and final throw: the loser faces voluntary slavery: though he be the younger and stronger man, he suffers himself to be bound and sold" (Tacitus [AD 98] 1914, 297–299).

There is an important difference between the actual operations of the game and the outcome of the game. The only way for a game to have negotiable consequences is if the operations and moves needed to play the game are mostly harmless. Any game involving actual weapons has strong *non-negotiable* consequences. This is in itself a point of contention, since many sports can lead to injury and even death. Arguably, part of the fascination with some sports such as boxing or motor sports lies in the fact that they are dangerous. Nevertheless, it is a convention of these games that injuries are to be avoided. Public outrage is likely if a motor sports event has poor security precautions.

The consequences of a game have a special status in that they are under continued negotiation, probably both in general societal terms—what is permissible for any game—and on a per-game basis, where the participants may openly or implicitly discuss the range of permissible reactions that the game can elicit.

Even so, all games have some officially sanctioned non-optional consequences, namely in that they may take the time and energy of the players and, more prominently, as described in point 5, that games can make the players happy or unhappy, hurt or boost their pride. But, again, this can happen only within certain negotiable limits, since there are several well known transgressions, such as excessive sulking (being a poor

loser), excessive boasting, or leaving the game prematurely if one is losing. The amount of permissible teasing and provoking of other players is not set in stone; there is a continuous breaking of ideals: Friendships may end over negotiations in *Monopoly* (Parker Brothers 1936), or players may get angry that their loved ones did not protect them in a game of *Counter-Strike* (The Counter-Strike Team 2000). However, *ideally* in game playing, this should not occur. The explicitly negotiated consequences concern what the players can consciously control, such as the exchange of goods or money, but the involuntary and less controllable reactions such as joy or sorrow are less clearly defined.

Since much of human interaction is symbolic rather than physical, this raises a question about the boundaries between games and non-games. For example, for any given country, we could in theory take the complete set of regulations regarding parliamentary elections and perform them as games in which contestants would perform actual rallies and speeches in order to make the public vote for the contestant who might then receive a cash prize rather than public office. This sounds much like a game and, in fact, it would be. Elections are not games since the consequences of the outcome are defined and not subject to negotiation, but the rules governing the execution of the election are potentially usable for game purposes. Many human activities can in principle be performed as games. Examples could include politics, courtship, and academia. Note that these are activities that are occasionally metaphorically described as being "games": the game of politics, the game of love, the game of getting tenure at universities.

Professional sports is a special case. According to Roger Caillois, the professional player or athlete is working rather than playing (1961, 6). This quickly becomes counterintuitive since a contest such as a marathon may include professional athletes as well as amateurs who are running "for the fun of it." This logically means that the marathon is and is not a game at the same time. A better explanation is that even professional players are *playing* a *game*, but that in this specific *game session*, the consequences have been negotiated to be financial and career-determining. Perhaps the reason it can be discussed whether professional sports are games or not is that we associate a game with the context in which it usually appears; that is, we tend to not think of something as a game if we have only seen it performed with serious consequences. So, even though the rules governing the stock market or elections could be used for game purposes, we do

not consider them games, and even though soccer is played professionally, we consider it a game because it is also played in non-professional settings and we are aware that its consequences are negotiable.

On the Borders of Games

In diagram form, we can visualize the game model as two concentric circles, where things considered games have all six previously defined features and therefore belong within the inner circle; borderline cases can be placed between the two circles; and decidedly non-game cases are placed outside the outer circle (figure 2.10).

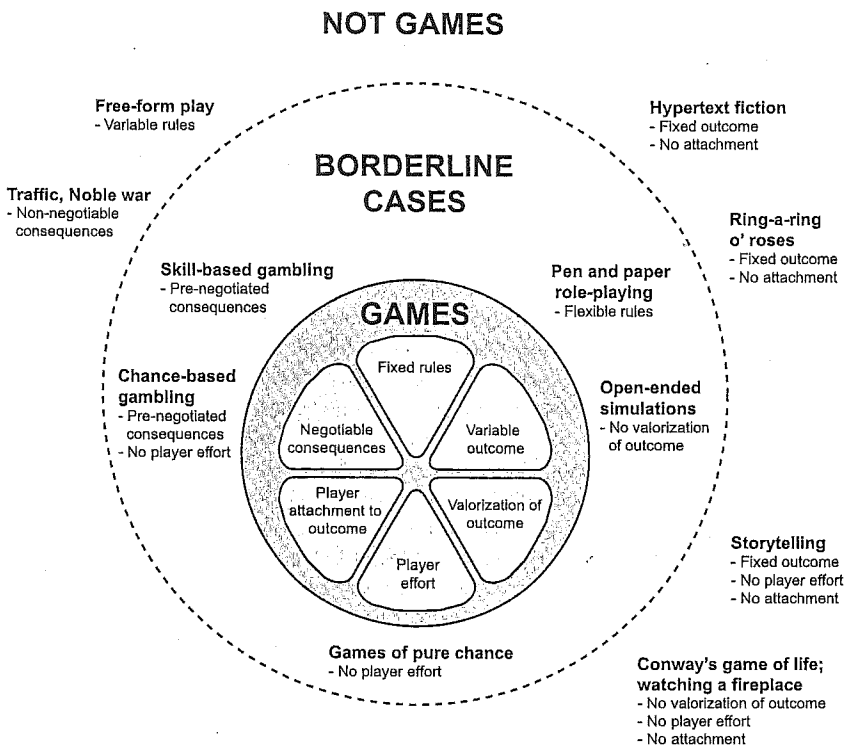
If we begin with the borderline cases: pen and paper role-playing games are not classic games because, having a human game master, their rules are not fixed beyond discussion.[11] Open-ended simulations like *SimCity* are not classic games since they have no explicit *goals*—that is, no explicit values are assigned to the possible outcomes of the game, but what happens in the game is still attached to the player and the player invests effort in playing the game.

Outside the set of games, free-form play has variable rules; structured play like ring-a-ring o' roses has fixed rules but also fixed outcome. Storytelling has fixed outcome, the player does not exert effort in order to influence the outcome, and the player is not personally attached to the outcome. Watching Conway's game of life or watching a fireplace is to experience a system with rules and outcomes, but there are no values assigned to the outcomes, the player is not attached to the outcome, and no player effort is required.

Traffic shares most of the game features, namely rules (traffic laws), variable outcome (you either arrive or you do not arrive safely), value attached to outcome (arriving safely is better), player effort, and players attached to the outcome (you actually arrive or do not), but the consequences of traffic are *not* optional—moving in traffic *always* has real-life consequences. The same applies to the concept of noble war such as war waged respecting the Geneva Convention.

Games as Objects and Games as Activities

Even with this definition, "game" can mean two things: A static object or artifact or an activity or event that players perform. Chess is a game (a static object), but we can also play a game of chess (an activity).



| Figure 2.10 |
On the borders of the classic game model.

According to this game definition, the game *as an object* is a list of rules with the property that a computer or a group of players can implement unambiguously: the rules must—if implemented—produce variable and quantifiable outcomes and describe how the player(s) can exert effort. The game must provide a description of which outcomes are positive and which are negative. The game must explicitly or by convention signal to players that it is an activity with an outcome to which they *should* feel

emotionally attached. Finally, the activity that the game describes must have consequences that are negotiable.

As an *activity*, a game is a system that changes state according to a set of rules that are implemented by humans, computers, or natural laws. The game is such that its outcome is undetermined, variable, and quantifiable. The players are aware that some outcomes are more desirable than others. The players are able to exert effort in order to influence the outcome. The players feel attached to the eventual outcome. Finally, the consequences of the game *have been* negotiated, ideally before the beginning of the game.

In practice, this distinction is mostly straightforward. Concepts such as rules and state machines statically describe dynamic objects. The more difficult distinctions concern the psychological aspects of games. It is possible to take anything with rules, variable outcomes, player effort, and negotiable consequences and turn it into a game by simply assigning values to the outcomes between players. For example, two people walking down the street can decide to turn it into a race by describing it as *better* to reach the destination first. A single person performing a mundane task such as sweeping the floor can decide to make it into a game by timing him or herself, trying to beat a personal record. Drawing on a piece of paper can be assigned simple rules and turned into a game. This can then become a convention—the two people who originally raced down the street can for a time permanently agree to race when turning a specific corner. The activity of doodling according to rules may feel sufficiently entertaining that the players tell others of their doodling game. Most of the things described as games are sufficiently well defined that they can be played again. This indicates that there is a loose idea that games are repeatable. When we speak of a specific game, we generally speak of it as being a repeatable event. Salen and Zimmerman explicitly write that "rules are repeatable" (2004, 139).

Game Examples

The game model does not mean that all games are the same, but it provides a way of describing what distinguishes different games from each other. The game model is implemented differently in various games:

Checkers

Let us look at an example game, checkers (or draughts):

1. Rules: In short form, the rules state that two players, white and black, each have twelve pieces that can move diagonally across the board, jump over opponent pieces and capture them.
2. Outcome: Defined as one player having lost all his or her pieces.
3. Value: Better to be the one with pieces left.
4. Effort: Consider moves.
5. Attachment: *You* win.
6. Negotiable consequences: Generally, a harmless pastime, but it is possible to play for money. Tournaments exist.

Soccer

1. Rules: Two teams with eleven players each, one of whom is a goalkeeper. Each team has a goal, which are at opposite ends of the playing field. Players can kick the ball but not touch it with their hands (goalkeepers can touch it with their hands). If the ball leaves the boundary of the playing field, the ball is given to the opposite team of the team that last touched it. Putting a ball in the opponent's goal scores a point. The game takes place within two halves of 45 minutes each.
2. Outcome: Defined as the goals scored within the time allotted to a game.
3. Value: The team with most goals wins.
4. Effort: Moving about, strategies, tactics, general skill in handling of the ball, communication.
5. Attachment: *Team* wins; the individual player can be *informally* judged on the basis of his or her achievements in the game.
6. Negotiable consequences: Social consequences in doing well for the team versus doing badly. Injuries non-negotiable; there are many professional leagues; betting is common.

Battlefield 1942

This refers to the "Conquest" game mode of *Battlefield 1942* (Digital Illusions 2002).

1. Rules: Two teams play against each other. There are rules regarding the movement of players, weapons, vehicles, level design, counting of points for having taken a base, respawning, etc. Some rules are explicit (counting of points); some rules are likely to be inferred by the player from the environment (guns kill); some rules, such as the way in which vehicles handle, have to be learned by the players.
2. Outcome: Defined as the accumulated time important locations on the map were held.
3. Value: More points (for time locations were held) win. Potentially one team can kill more players than the other team, but still lose the game.
4. Effort: Moving, shooting, strategies, communication.
5. Attachment: *Team* wins.
6. Negotiable consequences: Harmless, but some tournaments are being played. Social consequences in doing well for the team versus doing badly.

Borderline Case: SimCity

As previously mentioned, *SimCity* is considered a borderline case.

1. Rules: Rules regarding economy, buildings, assumptions about how the city works, transport. Some rules are explicit, some are inferred by the player from the setting, some contradict the setting—a power plant can be built in a few months in the game, unlike in real life.
2. Outcome: Few specified outcomes.
3. Value assigned to outcome: No outcomes are assigned values, though the player may feel that building a city is better than not building one, but the game conversely accommodates players who want to destroy their creations. Players may assign their own personal values to the different outcomes.
4. Effort: Building, planning.
5. Attachment: Whatever happens is to some extent the players *fault*, but this is loosely defined.
6. Consequences: Not a prime candidate for betting since the outcome is not clearly defined.

Transmedial Games

The definition of games proposed here does not tie games to any specific medium[12] or any specific set of tools or objects. Furthermore, we know that many games actually move between media: card games are played on computers, sports continue to be a popular video game genre, and video games occasionally become board games. Since this has not, to my knowledge, been explored in any systematic way, we can take a cue from narratology: stories cannot be examined independently but only through a medium such as oral storytelling, novels, and movies. Seymour Chatman has argued that narratives exist since they can be translated from one medium to another. "This transposability of the story is the strongest reason for arguing that narratives are indeed structures independent of any medium" (1978, 20). While it is clear that stories can be passed between a novel and a movie and back, it is also clear that not everything passes equally well. For example, novels are strong in creating inner voices and thoughts, while movies are better at conveying movement.

We can view games from a similar perspective: While there is no single medium or set of props that is the ideal game medium, games do exist, and do contain recognizable features, whether as card games, board games, video games, sports, or even mind games. There is no set of equipment or *material support* common to all games. What is common, however, is a specific sort of *immaterial support*, namely the upholding of the rules, the determination of what moves and actions are permissible and what they will lead to. Upholding the rules is in actuality provided by human beings (in board games or card games), computers, or physical laws (in sports).

The card game hearts can be transferred to a computer because the computer can uphold and *compute* the rules that would normally be upheld by humans, and because the computer has the *memory* capacity to remember the *game state*. The adaptation of board and card games to computers is possible due to the fact that computers are capable of performing the operations defined in the rules of the games, operations that are normally performed by humans, as well as keeping track of the game state, something normally done by using cards and board pieces. What we have is therefore an ecology of game media that support games, but do so differently. Thus games can move between different media—sometimes with ease, sometimes with great difficulty.

Chess qualifies as one of the most broadly implemented games, since chess is available as a board game, on computers, and even played *blind*, where the players keep track of the game state in their head. Sports are somewhat special in that the properties of the individual human body are part of the game state. This means that the rules of sports are less clearly defined than the rules of other games (hence the need for a referee). It is very hard to realistically implement the physics of something like pool, soccer, or bowling in video games. At the time of writing, there are several companies (e.g., Havok and Mathengine) dedicated exclusively to providing simulation of physics in video games.

Game Implementations and Game Adaptations

There are big differences in the ways that games move between media. Card games on computers should be considered *implementations* since it is possible to unambiguously map one-to-one correspondences between all the possible game states in the computer version and in the physical card game. Sports games on computers are better described as *adaptations*, since much detail is lost in the physics model of the computer program because it is a simplification of the real world, and in the interface because the video game player's body is *not* part of the game state. Adapting soccer to computers is therefore a highly selective adaptation. Game media support games in two distinct ways:

1. *Computation:* how the game medium upholds the rules and decides what happens in response to player input.
2. *Game state:* how the game medium keeps track of the current game state.

The distinction between computation and game state is necessary in order to explain the differences between some of the game media mentioned here (table 2.4). In technical terms, it corresponds to the low-level distinction in the computer between CPU (computation) and the RAM (memory).

- Generally speaking, video games are a superset of board games and card games; most card and board games are immediately implementable in computer programs. The physical setting around the game does not translate well.

Table 2.4
Games moving between media

	Rules/computation	Game state
Card games	Human brain	Cards
Board games	Human brain	Game pieces
Blind chess	Human brain	Human brain
Competitive sports	Physics + human brain	Players' bodies/ game objects
Video games	Computer (CPU)	Computer (RAM)
Card/board games on computer	Computer (CPU)	Computer (RAM)
Sports on computer	Computer (CPU)	Computer (RAM)

- Board games implemented on computers include *Axis & Allies* (Hasbro Interactive 1998), *Risk* (BlueSky Software 1997), chess, checkers, and backgammon.
- The feasibility of adaptation from video game to board or card game depends on the game. In the 1980s, many popular arcade games were used for selling poor quality board games: this befell (among others) *Pac-Man* (Milton Bradley 1982), *Berzerk* (Milton Bradley 1983), and *Frogger* (Milton Bradley 1981).
- One of the most popular adaptations is from sports to video games. These adaptations are imperfect due to both lack of fidelity in the physics simulations and the low amount of information that the player can input, but they are also extremely popular, probably because they allow players to imagine that they are doing something they could not normally do.[13]
- Video game to sport adaptations are almost nonexistent. A notable exception is that some players of paintball games have adopted the rules of *Counter-Strike*.
- Card decks are good at keeping track of possessions, and resources and at hiding information.
- Board games provide possessions and spatial gameplay well, but are most immediately suited to games of perfect information (where all players have access to all information in the game). This is easily implemented on computers.

- Dance and rhythm games like *Dance Dance Revolution* (Konami 2001) are special in that the amount of information transferred between the player and the game state is very low, but the body is nevertheless heavily involved since the physical layout of the dance mat requires you to move your body in order to play.
- Sports allow for many things that video games cannot, mostly because of the importance of bodily capabilities in the world and the depth of the "interface." More information is transferred to the game state—in fact, the player's body is part of the game state.

Game Implementations: Mapping between Domains

The distinction between an implementation and an adaptation concerns whether there is an unambiguous correspondence between the possible game states in the two game versions. Nevertheless, two games that appear completely unrelated can turn out to be equivalent on a game state to game state basis. For example, a spatial game may be converted into a non-spatial game.[14] Consider the following game:

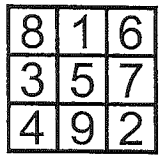
Two players take turns picking a number between 1 and 9. Each number can only be picked once. The first player to have 3 numbers that add up to 15 has won. If all numbers are picked without a winner, the game is drawn.[15]

As an example game between player A and player B:

1. A picks 5.
2. B picks 9.
3. A picks 2.
4. B has no choice but to pick 8 (otherwise, A could get 5+2+8=15).
5. A picks 7, and thereby threatens to win by either picking 3 (5+7+3=15) or 6 (2+7+6=15).
6. At this point, B has lost because the first pick (9) was a mistake.

If this sequence seems familiar, it is because it can be completely mapped to the example game of tic-tac-toe earlier in this chapter: If we lay out the numbers 1 to 9 in a 3 × 3 grid, the game is an implementation of tic-tac-toe (figure 2.11).

Picking the numbers 6, 7, and 2 is therefore identical to placing three pieces in the rightmost column; if your opponent has picked 5 and 2, it is a



| Figure 2.11 |
Tic-tac-toe as a mathematical game: Pick three numbers that add up to 15.

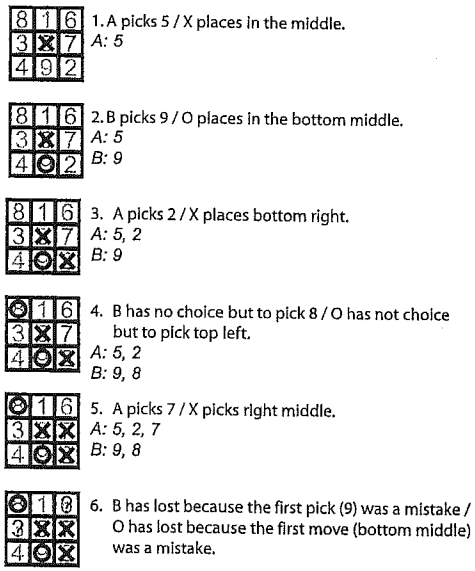
good idea to pick 8 in order to prevent him or her from getting a sum of 15. This works because the numbers above are laid out in a *magic square* where the sum of each vertical, horizontal, and diagonal line adds up to 15. (For the history of magic squares, see Danesi 2002, 147–151.) Compare the two games (figure 2.12).

This mathematical game is *equivalent to* tic-tac-toe in the sense that there is an unambiguous mapping between every possible position in tic-tac-toe and every possible position of the mathematical game. The two games are, however, probably not *experienced* identically by players—in tic-tac-toe, players will think of the game as a spatial problem; in the mathematical game, players will think of the game as a game of adding numbers. Anecdotal evidence suggests that most players find tic-tac-toe *much* easier. *This means that games that are formally equivalent can be experienced completely differently.*

The Limits of the Classic Game Model

While some writers have claimed that games are forever indefinable or ungraspable, a review of David Parlett's two books *The Oxford History of Board Games* (1999) and *The Penguin Encyclopedia of Card Games* (2000) indicates that all of the hundreds of games described fall within the *classic game model.* The vast majority of things called "games" are found in the intersection of the six features of the game model. It is an intersection that can be traced historically for at least a few thousand years and through most human cultures.

Why is there an affinity between computers and games? Because games are a transmedial phenomenon, and the material support needed



| Figure 2.12 |
Equivalence between tic-tac-toe and a mathematical game.

to play a game (like the projector and the screen in cinema) is *immaterial,* since games are not tied to a specific set of material devices, but to the processing of rules. This fits computers well because the well defined character of game rules means that they can be implemented on computers.

The classic game model is no longer all there is to games. With the appearance of role-playing games, where a game can have rules interpreted by a game master, and with the appearance of video games, the game model is being modified in many ways.

1. *Rules:* While video games are just as rule-based as other games, they modify the classic game model in that it is now the *computer* that upholds the rules. This gives video games much flexibility, allowing for rules more complex than humans can handle; freeing the player(s) from

having to enforce the rules; and allowing for games where the player does not know the rules from the outset.

2. *Variable outcome:* In many cases, the computer can act as a referee in order to determine the outcome of a game on the basis of events that would not be immediately discernible to a human.

In persistent online games, the player never reaches a final outcome but only a temporary one when logging out of the game.

3. *Valorization of outcome:* Open-ended simulation games such as *The Sims* change the basic game model by removing the goals, or more specifically, by *not* describing some possible outcome as better than others.

4. *Player effort:* The non-physical nature of video games means that player effort can work in new ways. For example, the player can control a large number of automatic units in a real-time strategy game, which would not be possible in a non-electronic game.

5. *Attachment to outcome:* Because an open-ended simulation game does not have a specific win or lose state, it gives the player a less well defined relation to the game outcome.

6. *Negotiable consequences:* It is perhaps implicit in the classic game model that a game is bounded in time and space; the game has a specific duration and a specific location. Pervasive games, location-based games, and some live-action role-playing games break this, as do games such as *Majestic* (Anim-X 2001) where actual phone calls are part of the playing of the game.

Let us consider what the classic game model does: It provides a bare-bones description of the field of games; it explains why computers and games work well together; it explains why games are transmedial; and it points to some recent developments in games. The game model by itself does not provide much explanation of the variations between games, or of why games are enjoyable. It is an abstract platform upon which games are built, a platform that games use in different ways.

Games *do* have something in common; we *can* talk about the borders between games and what is not a game—video games are the latest development in a history of games that spans millennia.

| 3 |
RULES

Game rules are paradoxical: Rules and enjoyment may sound like quite different things, but rules are the most consistent source of player enjoyment in games. We may associate rules with being barred from doing something we really want, but in games, we voluntarily submit to rules. Game rules are designed to be easy to learn, to work without requiring any ingenuity from the players, but they also provide challenges that *require* ingenuity to overcome. Finally, the rules of a game tend to add up to more than the sum of their parts: For most games, the strategies needed to play are more complex than the rules themselves.

Fixed rules are a core feature of games, but rules do not appear out of nowhere; they are created by players in folk games and by game designers in commercial games. Many games are played using either playing cards or computers, but the rules appear to *be the same*, even if it is the players that uphold the rules when played with cards, but the computer that upholds the rules in the video game version. As a game can move between different media, so can the rules that make up the game. But then what are rules made of and what function do game rules serve?

Let us assume that games are enjoyable in part because players *enjoy* the sense of accomplishment that solving a challenge gives them. In a multiplayer game, the enjoyment may also come from the interaction with other players, the contest or the teamwork involved in playing the game. These are not the only enjoyable aspects of games, but they are surely among the most universal ones.

In short, rules work like this.

1. *Rules* are designed to be above discussion in the sense that a specific rule should be sufficiently clear that players can agree about how to use it. Rules describe what players can and cannot do, and what should