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The Game, the Player, the World: Looking for a Heart of Gameness

Keynote presented at the Level Up conference in Utrecht, November 4th-6th 2003.

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Jesper Juul: "The Game, the Player, the World: Looking for a Heart of Gameness". In *Level Up: Digital Games Research Conference Proceedings*, edited by Marinka Copier and Joost Raessens, 30-45. Utrecht: Utrecht University, 2003.

<http://www.jesperjuul.net/text/gameplayerworld/>

ABSTRACT

This paper proposes a definition of *games*. I describe the *classic game model*, a list of six features that are necessary and sufficient for something to be a game. The definition shows games to be *transmedial*: There is no single game medium, but rather a number of game media, each with its own strengths. The computer is simply the latest game medium to emerge. While computer games¹ are therefore part of the broader area of *games*, they have in many cases evolved beyond the classic game model.

Keywords

Game definition, game history, transmedial gaming; computer game history.

Introduction

Why is there an affinity between computers and games? Why do we play games on computers rather than using any other recent technology such as the telephone, TV, microwave ovens, cars, or airplanes? Computers appear to work as enablers of games, supporting and promoting games much in the way that the technologies of the printing press, cinema, and television have promoted storytelling. But how do we explain this affinity?

My intention here is to claim the existence of a *classic game model*; a standard model for creating games, a model that appears to have been constant for several thousand years. While computer games were initially based almost exclusively on the classic game model, we can point to several ways in which they have evolved from their non-electronic roots.

While many definitions of games have been attempted, my goal here is to create a game definition capable of explaining what relates computer games to other games and what happens on the borders of the field of games. But what should the definition to look like? We are probably interested in understanding both the properties of the games themselves (the artifact designed by the game developers), how you interact with them as a player, and what the relation is between playing and, say, working. So let's assume that a good game definition should describe three things: 1) The kinds of systems set up by the rules of a game (*the game*). 2) The relation between the game and the player of the game (*the player*). 3) The relation between the playing of the game and the rest of the world (*the world*).²

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*, *EverQuest*, *checkers*, *chess*, *soccer*, *tennis*, *Hearts*, *Solitaire* and *pinball* are games; that open-ended simulation games such as *Sims* and *Sim City*, gambling, and games of pure chance are borderline cases; and that traffic, war, hypertext fiction, free-form play and ring-a-ring-a-roses are not games. The definition should be able to tell 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* a specific game is a borderline case.

Some previous definitions

The method I am applying here is to go through seven previous definitions of games, pick out their similarities and point to any modifications or clarifications needed for our current purpose. But before

going over the previous definitions, we should note that the definitions do not necessarily try to describe the same aspect of games: Some focus purely on the game as such, some focus purely on the activity of playing a game. Additionally, it turns out that many things can be expressed in different ways. When one writer mentions goals and another mentions conflict, it is possible to translate between them: The notion of conflict entails (conflicting) goals; the notion of goals seems to entail the possibility of not reaching the goal, and thereby also a conflict. We will get back to this, but let us simply list seven game definitions which we will then categorize afterwards:

Source	Definition
Johan Huizinga 1950, p.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, p.10-11.	[...] an activity which is essentially: Free (voluntary), separate [in time and space], uncertain, unproductive, governed by rules, make-believe.
Bernard Suits 1978, p. 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.
Avedon & Sutton Smith 1981, p.7.	At its most elementary level then we can define 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 disequibrial outcome.
Chris Crawford 1981, 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, p.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 & Eric Zimmerman 2003, p.96.	A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.

There are probably more commonalities than differences in these definitions. But if we return to the idea that 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 a formal system. That a game is "outside ordinary life" describes the relation between the game and the rest of the world. But that a game has an "object to be obtained" describes the game as formal system *and* the relation between the player and the game. If we take "goals" and "conflict" to be different ways of expressing the same concept, this allows us to gather all the points of the definitions under ten headings:

	The	The	The	Other

	game as formal system	player and the game	game and the rest of the world	
Rules Fixed rules (Huizinga) Rules (Caillois) Rules (Suits) Procedure & rules (Avedon & Sutton-Smith) Formal system (Crawford) Rules (Kelley) Rules (Salen & Zimmerman)				
Outcome Uncertain (Caillois) Disequilibrium outcome (Avedon & Sutton-Smith) Changing Course (Kelley) Quantifiable outcome (Zimmerman & Salen)				
"Goals" Bringing about a state of affairs (Suits) Opposition (Avedon & Sutton-Smith) Conflict (Crawford) Object to be obtained (Kelley)				
Interaction Interaction (Crawford)				
Goals, rules, and the world Artificial conflict (Zimmerman & Salen)				
"Separate" Outside ordinary life / proper boundaries (Huizinga) Separate (Caillois) No material interest (Huizinga) Unproductive (Caillois)				
"Not work" Free / voluntary (Caillois)				

Voluntary control systems (Avedon & Sutton-Smith) Recreation (Kelley)				
Less efficient means Less efficient means (Suits)				
Social groupings Promotes social groupings (Huizinga)				
Fiction Representation (Crawford) Make-believe (Caillois) Safety (Crawford)				

The loose ends

Fiction

The issue of fiction in games is tricky since it depends much on the games we are looking at. For the time being, suffice to say that *some* games have a fictional element, but that it is not universal to games.

The game and the player: A second look at goals

The list of examples gives us two border case examples around the concept of goals: *Sims* and *Sim City* are often labeled games even if they do not have explicit goals. While the games' designer, Will Wright, claims that they are not games but toys (Costikyan), they are nevertheless often categorized as "computer games".

The proposal here is to be more explicit about the player's relation to the game by splitting the concept of goals into three distinct components, namely: 1) Valorization of the possible outcomes: That some outcomes are described as positive, some as negative. 2) Player effort: That as a player you have to *do* something. 3) Attachment of the player to an aspect of the outcome. As a player you agree to be happy if you win the game, unhappy if you loose the game. This is part of what we may term *the game contract* and curiously happens even in a game of pure chance.

Separate and unproductive: Negotiable consequences

In the definition of Roger Caillois, games are both *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 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 around one's daily business. Likewise, many net-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' suggestion is that even gambling does not *produce* anything. From an economic viewpoint, this is problematic since gambling is in fact a huge industry. Let us note that it is possible to bet on the outcome of any game⁴, and that many people do make a living playing games.

Separation is a special issue in live action role-playing games, 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.⁵

Taking a step back, we can see that the notion of *separate* and the notion of games being *unproductive* are quite similar in two respects, 1) both specify what interactions are possible (and allowed) between the game activity and the rest of the world and 2) both are clearly not perfect boundaries, but rather fuzzy areas under constant negotiation.

When Caillois claims that a game played involuntarily is not a game, we need to make a distinction between a given game and a given playing of a game. All copies of Quake III do not suddenly cease to be games because someone is making money playing it. And since all games are potential targets of

betting and of professional playing, I suggest that games are characterized by being activities with *negotiable consequences*: A specific playing of a game may have assigned consequences, but a game is a game because the consequences are *optionally* assignable on a per-play basis. That games carry a degree of separation from the rest of the world follows from their consequences being negotiable.

A new definition: 6 game features

The game definition I propose finally has 6 points: **1) Rules**: Games are rule-based. **2) Variable, quantifiable outcome**: Games have variable, quantifiable outcomes. **3) Value assigned to possible outcomes**: That the different potential outcomes of the game are assigned different values, some being positive, some being negative. **4) Player effort**: That the player invests effort in order to influence the outcome. (I.e. games are challenging.) **5) Player attached to outcome**: That the players are attached to the outcomes of the game in the sense that a player will be the winner and "happy" if a positive outcome happens, and loser and "unhappy" if a negative outcome happens. **6) Negotiable consequences**: The same game [set of rules] can be played with or without real-life consequences.

A game is a rule-based formal 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 attached to the outcome, and the consequences of the activity are optional and negotiable.

	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. Valorization of outcomes			
4. Player effort			
5. Player attached to outcome			
6. Negotiable consequences			

These points are not on the same level, rather:

- 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.
- 4-5 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 point merits further elaboration:

1. Fixed rules

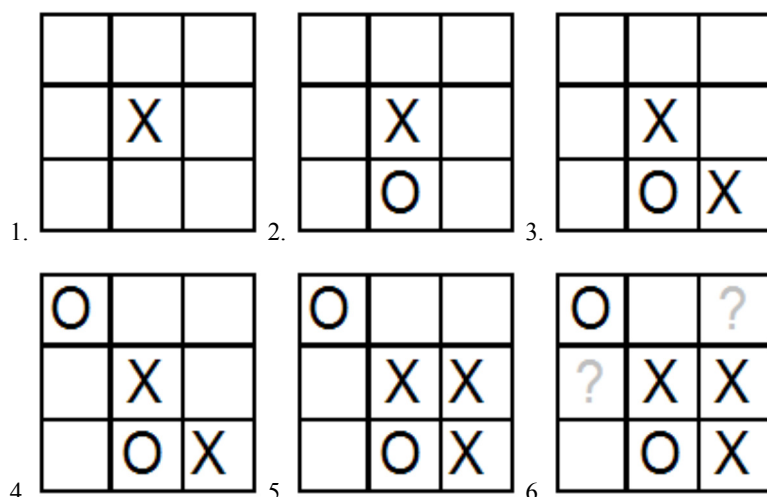
Games have rules.⁶ The rules of games have to be sufficiently well defined that they can either be programmed on a computer or sufficiently well defined that you do not have to argue about them every time you play. In fact, the playing of a non-electronic game is an activity that in itself involves trying to remove any unclearness in the game rules: If there is disagreement about the rules of the game, the

game is stopped until the disagreement has been solved. In a commercial game, the developer will (hopefully) have made sure that the rules are unambiguous, but what about non-commercial games? A non-electronic and "folk" (i.e. non-commercial) game tends to drift towards becoming unambiguous, not in the sense that they don't require ingenuity to *play*, but in the sense that it doesn't require ingenuity to *uphold the rules*. 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 towards unambiguity in games makes them ripe for implementation in a programming language.

To borrow some concepts from computer science, the rules of any given game can be compared to a piece of *software* that then needs *hardware* to actually be played. In games, the hardware can be a computer, mechanical contraptions, the laws of physics, or even the human brain.

2. Variable and quantifiable outcome

For something to work as a game, the rules of the game must provide different possible outcomes. This is pretty straightforward, but for a game to work as a game *activity*, the game must also fit the skills of the player(s). Consider this game of tic-tac-toe:



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 simply due to the fact that the *first* move (bottom middle) was a mistake.

This is a general property of tic-tac-toe: If your opponent begins with the middle, you must *always* place your first piece in the corner, otherwise you will lose to a reasonably intelligent opponent.² This incidentally explains why tic-tac-toe is a children's game, and this is where we find that there is a subjective aspect to games: As a child, tic-tac-toe remains interesting because you still find the choices mentally challenging. Once you figure out the principle, you will achieve a draw every time you play. Variable outcome depends on who plays them, i.e. if players always achieve a draw or if a master player plays his/her best against a beginner, it does not really work as a game *activity*.

Many games provide features for ensuring a variable outcome. For example, Go, golf, or fighting games like *Tekken* allow for handicaps for the players in an attempt to even out skill differences. A few racing games arguably cheat to even out the skill differences between players: In *Gran Turismo 3*, players who are trailing behind on the race track automatically drive faster than the leading players, allowing them to catch up.

Likewise, players themselves may feign ineptitude in order to bring some uncertainty about the outcome - the Tekken 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 might term this *player-organized criticality* - in the same way that players try to uphold the rules, the players may also try to uphold ensure a variable game outcome.

Finally, quantifiable outcome means that the outcome of a game is designed to be beyond discussion, meaning that the goal of *Pac Man* is to get many points, rather than to "move in a pretty way"³. Since playing a game where the participants disagree about the outcome is rather problematic, this undergoes the same development as the rules of a game, towards unambiguity.

3. Valorization of the outcome

This simply 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: It can be a statement on the box ("Defend the Earth"); it can be stated in the instructions of the game; it can be signaled by the fact that some actions give a higher score than others; by virtue of there only being 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 him/herself against them.

There is a tendency that the positive outcomes are harder to reach than the negative outcomes - this is what makes a game challenging; a game where it was easier to reach the goal than not to reach it would likely not be played very much.

4. Player effort

Player effort is another way of stating that games are challenging, or that games contain a conflict, or that games are "interactive". It is a part of the rules of most games (except games of pure chance) that the players' actions can influence the game state and game 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.

5. Attachment of the player to the outcome

Attachment of the player to the outcome is a psychological feature of the game activity which means that there is a convention by which the player is attached to specific aspects of the outcome. A player may actually feel happy if he/she wins, and actually unhappy if he/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 towards the game; it is part of what we may term the "game contract" or *lusory attitude* (Suits, p.38-40) that the player agrees to by playing. 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, it is then a question of honor to conform to the negotiated outcome. We should probably emphasize that there is a 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 to have the *operations* and *moves* needed to play the game are predominantly harmless. Any game involving actual weapons has strong *non-negotiable* consequences. This is in itself a point of contention since especially sports carry a lot of injuries and even death with them. Arguably, part of the fascination with some sports such as boxing or motor sports lie in the fact that they are dangerous. But yet it is part of how we treat these games that injuries should be avoided. There will be a public outrage if Le Mans has slack security precautions.

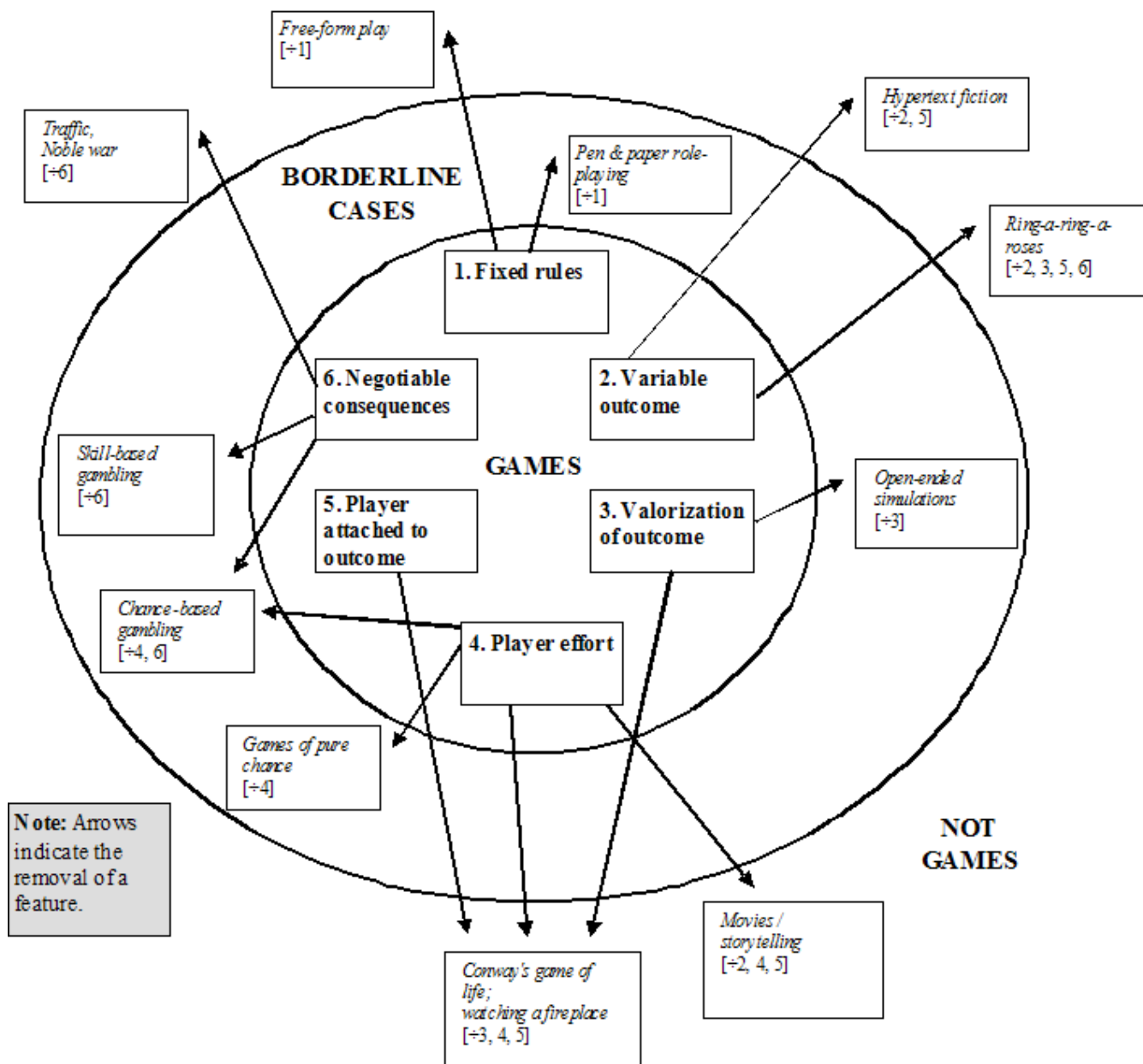
But even so, all games have some officially sanctioned non-optional consequences, namely in that they make take the time and energy of the players, and, more prominently, the attachment described in point 5: that games are allowed to make the players happy or unhappy, to hurt or boost their pride. But then again, only within certain negotiable limits, since there are some quite well-known transgressions such as excessive sulking (being a poor loser), excessive boasting, leaving the game prematurely if one is losing. Especially the amount of permissible teasing and provoking of other players is not set in stone. In actuality, there is a continuous breaking of these ideals: friendships may end over negotiations in Monopoly; players may get angry that their loved ones didn't protect them in a game of Counter-Strike. However, it is apparently an ideal for game-playing that this kind of thing should not occur. It seems that the explicitly negotiated consequences concern aspects that the players can consciously control - such as the exchange of goods - but that involuntary and less controllable reactions such as joy or sorrow require a testing of the waters and are generally less clearly defined.

A special issue regards professional sports. According to Roger Caillois, the professional player or athlete is working rather than playing (p.6). This quickly becomes rather 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 would logically mean that the marathon is and isn't a game at the same time. A better description is to say that even professional players are *playing a game*, but in this specific *game session*, the consequences have been negotiated to be financial and career-determining. Perhaps the reason why we can discuss whether professional sports are games or not is that we associate the game

rules with the context they are usually used in. We tend to not think of something as a game if we have only seen it performed without serious consequences. Hence, even though the rules governing the stock market or elections could be used for game purposes, we do not consider them games, and though soccer is played professionally, we consider it a game because we are also aware that it is being played in non-professional settings.

The game diagram

In diagram form, all of this can be visualized as two circles as things considered games having all 6 features within the inner circle, borderline or game-like cases falling in the outer circle, and decidedly non-game cases falling outside the outer circle as well:



Beginning with the borderline cases: Pen and paper Role-playing games are not normal games because with a human game master, their rules are not fixed beyond discussion⁸. Open-ended simulations like Sim City fall outside because they have no explicit *goals*, i.e. no explicit value attached 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 Sim City.

Falling completely outside the set of games, free-form play has no rules; hypertext fiction tends to be a question of browsing a story that doesn't change; structured play like ring-a-ring-a-roses has rules, but a constant outcome; movies and storytelling tend to have values attached to the outcome even if there is only one; watching Conway's game of life unfold or watching a fireplace qualifies as a watching a system with rules and variable outcome, but no values are assigned to the specific outcomes; the player is not attached to the outcome, and no player effort required.

Traffic shares most of the game features, namely rules (traffic laws), variable outcome (you either

arrive or you don't 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.

Transmedial gaming

The definition of games proposed here does not tie games to any specific medium or any specific set of props. Furthermore, we know that many games actually move between media: Card games are played on computers, sports continue to be a popular computer game genre, and computer games occasionally become board games. Since this to my knowledge has not been explored in any systematic way, we can take a cue from discussions of stories: Narratives can not be viewed independently, *an sich*, but only through a medium like oral storytelling, novels, and movies. But we can see 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. (Chatman 1978, p.20)

While it is clear that something 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 better at conveying movement.

We can therefore view games in a similar perspective: While there is no single medium¹⁰ or set of props that is *the* game medium, games do exist, and do contain recognizable features whether being card games, board games, computers games, sports, or even mind games. Looking at all these, it is quite clear that 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. This can conveniently be described as *computation*, which is in actuality provided by human beings (in board games or card games), computers, or physical laws (in sports).

The reason why the card game *Hearts* is transferable to a computer is that the computer can uphold and *compute* the rules that would normally be upheld by humans, and that the computer has the *memory* capacity to remember *game state* and the *interface* to respond to player input. So the adaptation of board and card games to computers is possible due to the fact that computers are capable of performing 1) the operations defined in the rules of the games, operations that is normally be performed by humans, and 2) the keeping track of the game state which is normally done using cards and board pieces. What we have is therefore an ecology of game media that support gaming, but do so differently, and of games that 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, as well as being 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 there is less of a clear distinction between the game state and the rest of the world, and that the rules are less clearly defined (hence the need for an umpire).¹¹

Game implementations and game adaptations

Note that there are differences in the way 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 on the level of the rules and game state since the physics model of the computer program is a simplification of the real world, and in the interface because the 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 three distinct ways:

1. *Computation*: How the game medium upholds the rules and decides what happens in response to player input.
2. *Game state*: What keeps track of the current game state.
3. *Interface*: How *detailed* an influence the players have on the game state. For example, a simple yes/no choice is one bit, whereas in competitive sports, the detail of the influence is huge since the players themselves are part of the 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. In technical terms, the distinction between computation and game state corresponds to the low-level distinction in the computer between CPU (computation) and the RAM (memory):

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

Conclusions

While some writers have claimed that games are forever indefinable or ungraspable, I hope to have indicated that games *do* have something in common, that we *can* talk about the borders between games and what is not games, and that it makes sense to look at computer games as being the latest development in a history of games that spans millennia.

The definition proposed here describes games mainly as real rule-based systems that players interact with in the real world. This is a markedly different description from another common one, namely that of describing games as fictive worlds. The relation between these two perspectives is something of an ongoing discussion in games, for game players, and for game designers. In theoretical terms, the question of fiction in games has been described in different, conflicting ways. Erving Goffman proposes a principle called *rules of irrelevance*, meaning that the specific shape of a piece in a game is not important. This goes against Crawford's emphasis on the *safety* on games and Caillois' mention of *make-believe* - in both cases, the fictive or make-believe aspect of games is considered important. The relation between rules and fiction in games is a huge subject of its own, but suffice to say that it's not an either/or question.

Discussing the rules of games, we may have a nagging feeling that games contain a built-in contradiction: Since we would normally assume play 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.

After the classic game model

While computer games mostly fall into the classic game model, they also modify and work with many of the conventions of classic games. We find that games *have* changed. So while we can talk about games as being a fairly well-defined form, computer games also modify the classic game model and the history of computer games is to a large extent is about breaking with this standard model of games:

1. While computer 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 adds a lot of flexibility to computer

games, allowing for much more complex rules; it frees the player(s) from having to enforce the rules, and it allows for games where the player does not know the rules from the outset.

2. The concept of a variable outcome is modified in online role-playing games such as *EverQuest*, where the player never reaches a final outcome but only a temporary one when logging out of the game.
3. Open-ended simulation games such as *The Sims* change the classic game model by removing the goals, or more specifically, by *not* describing some possible outcomes as better than others.
4. Perhaps implicit in the traditional game model is that fact that a game is bounded in time and space; the game has a specific duration and a specific location. Location-based games and assassin's games break this concept, as do some "real-world" games such as *Majestic*.
5. The common practice of including semi-official cheat codes in modern computer games means that the player in many cases is free to modify some of the basic rules of a game; the game acquires a quality of becoming a playground or a sandbox.

The affinity between computers and games

Why is there an affinity between computers and games? First of all, because games are a transmedial phenomenon. The material support needed to play a game (like the projector and the screen in cinema) is in fact *immaterial* since games are not tied to a specific set of material devices, but to the computational processing of data. Secondly, because the well-defined character of game rules means that computers can process them. It is then one of the stranger ironies of human history, that the games played and developed over thousands of years have turned out to fit the modern digital computer so well.

The six game features 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 make something a game. While we can imagine any number of other phenomena that share only some of these traits and some others, the claim here is that 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 on 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 doesn't mean that all games are the same, but that these six features are what games use to be different from each other.

Finally, the revolution in games that computers have provided is one of their strongest contributions to human culture. We like to play games, so now we play computer games.

Acknowledgements

I am indebted to Clara Fernandez, Chaim Gingold, Henry Jenkins, Aki Järvinen, Susana Pajares Tosca and Eric Zimmerman for comments & discussions.

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Notes

1 By computer games I mean all games played *using computer processing power*: PC and Macintosh-based games, console games, arcade games, cell phone games, etc..

2 It is of course a common assumption, following Ludwig Wittgenstein, that games *cannot* be defined.

[66.] Consider for example the proceedings we call 'games'. I mean board-games, card-games, ball-games, Olympic Games, and so on. 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.

[...]

[67]. I can think of no better expression to characterize these similarities than 'family resemblances', for the various resemblances among members of the same family: build, features, color of eyes, walk, temperament, etc. overlap and criss-cross in the same way. And I shall say, 'Games form a family.'
(*Philosophical Investigations*, segment 66-67.)

As Bernard Suits points out (Suits 1978, p.x), the suggestion that we should look and see whether there are commonalities to games is a good one, but it is unfortunately not really an advice that Wittgenstein himself follows.

3 This table was inspired by Zimmerman & Salen's work on game definitions, where they provide a more fine-grained table of 8 different game definitions (2003, p.95).

- 4 The possibility of betting hinges on the quantitative outcome of a game - it is only possible to bet if the outcome is beyond discussion.
- 5 In the MIT Assassins' guild game played February 23rd 2003, the rules stated the following:
Non-Players: Not everyone in the world is playing in this game. Some non-players (**NPs**) like to sleep or study undisturbed; others just don't like having toy guns waved in their faces. [...] NPs may not knowingly affect the game. They may not be used to hold items or information. They may not help you kill someone. Do not use the presence of NPs to hide from rampaging mobs that want your blood.
(MIT Assassin's guild 2003, p. 1)
- 6 I have often met resistance to the idea that games have formal rules, probably because it sounds too much like structuralism. But there is a difference. I think that especially in structuralist narratology, many mistaken assumptions were made - a story does not really have a simple underlying deep structure; there is no formula for the creation of all stories. Neither is there a formula for the creation of games. However, every game is a formula for the creation of the game sessions. There is a limited amount of games that can be played in tic-tac-toe, Quake III, or chess. In Quake or chess, the number is simply rather large.
- 7 This is an emergent or perhaps 2nd order consequence of the rules of tic-tac-toe: The rules of tic-tac-toe do not specify this; it is a *consequence* of the rules of the game.
- 8 Some judged sports such as figure skating rely on the extra layer of judges to transform the qualitative movement of the skater into a quantitative outcome. (See Suits 1995 for a discussion.)
- 9 Rather much of the enjoyment of role-playing games is due to the flexibility of the rules.
- 10 I am using the term *medium* in a rather non-technical sense, as a set of technologies that support a variety of different expressions. Due to the general plasticity of rule-based systems, we could potentially describe games as media and game media on a number of different levels:
 - Games as such can be viewed as an immaterial medium.
 - Computers as such are a game medium.
 - A Playstation 2 or any other console is a game medium
 - A set of cards (combined with a human brain) or any other set of physical props is a game medium.
 - Any toolkit or engine for making games (such as RenderWare, Lithtech, or Half-Life, or Counter-Strike) is a game medium, with the option of building an infinite number of sub-media on top, each with their own affordances and constraints.
- 11 What is perhaps contrainuitive is that it is very hard to realistically implement the physics of something like pool, soccer, or bowling in computer games. In fact, at the time of writing, there are several companies such as Havok and Mathengine dedicated exclusively to providing simulation of physics in computer games.