

Chapter 11: Defining Rules

Overview



*The rules of chess, of course, state how the pieces may be moved; they distinguish between legal and illegal moves. Since the knight, for example, is permitted to move only in a highly restricted manner, it is clear the **permitted** means for moving the knight are of less scope than the **possible** means for moving him.—Bernard Suits, Grasshopper: Games, Life, and Utopia*

What are game rules? Let's begin with a simple example, one of the most minimal games we can find: Tic-Tac-Toe. The game of Tic-Tac-Toe is defined by the following set of rules:

1. Play occurs on a 3 by 3 grid of 9 empty squares.
2. Two players take turns marking empty squares, the first player marking Xs and the second player marking Os.
3. If one player places three of the same marks in a row, that player wins.
4. If the spaces are all filled and there is no winner, the game ends in a draw.

These four rules completely describe the formal system of Tic-Tac-Toe. They don't describe the experience of playing the game, they don't describe the history and culture of the game, but they do constitute the rules of the game. These four rules are all you need to begin playing a game of Tic-Tac-Toe.

Astonishingly enough, these simple rules have generated millions and millions of hours of game play. Armed with these rules, any two Tic-Tac-Toe players can be assured that when they begin play, they will both be playing the exact same game. Whether played in front of a computer terminal or scratched in the sand of a beach, every game of Tic-Tac-Toe shares the same basic formal identity. In this sense, rules are the deep structure of a game from which all real-world instances of the game's play are derived.

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A Deck of Cards

In exploring games as formal systems it is important to determine exactly what are and are not rules. Rules are the logical underbelly beneath the experiential surface of any game. But because games are innately structural, it can be tricky to distinguish which structures in a game are part of the rules and which are not. For example, what elements of the game of Poker constitute the rules of Poker? Some structures are unambiguously part of the rules. The guidelines that dictate how many cards to deal to each player, how to bet, and the value of different combinations of cards all clearly seem to be part of the game rules.

Any complete set of rules of Poker will also reference a deck of standard playing cards. This deck of cards is part of the rules, because the particular mathematical qualities of the deck (the exact number of cards, the fact that each card is defined by a number and a suit, etc.) are a crucial part of the game. Most variants of Poker, for example, specify whether or not Jokers are to be used. The constitution of a deck of playing cards is always part of the rules of Poker, even though this element of the rules usually goes unstated. The relationship between stated and unstated rules will come up again in later chapters. For now, it is enough to know that the rules of Poker contain—or at least imply—the precise structure of a deck of playing cards.

What if the deck of cards was altered by changing its four suits? Would we still be playing the same game? Perhaps Spades becomes Death, Hearts becomes Love, Clubs becomes War, and Diamonds becomes Sex. The change might entail a graphical alteration to the suits as they appear on the cards or the name by which players refer to the cards. (*"I've got an eight of War."*) This seems like a radical change to make to a deck of cards. But on a formal level, nothing has changed at all: the game remains the same. Players could, with this deck, still play a game of Poker, as long as the deck was composed of four suits in a rank order and 13 numbers. Some aspects of certain Poker variants, such as playing with Red Queens as wild cards, might require a translation to the new deck, but as long as the game's formal structure remained intact, designating the Queens of Love and Sex as wild cards is the same as making the Red Queens wild in a regular deck. Of course it goes without saying that the *experience* of playing Poker with such a deck would be different than the experience a player would have with a standard deck. But the formal system of a game, the game considered as a set of rules, is *not* the experience of the game. Therefore, when looking at games from the point of view of rules, we are less concerned with player experience than with the rules constituting the experience. Although this distinction creates an artificial separation between the structure of a game and players' experience of the structure, the separation allows us to look at games as formal systems.

Formally speaking, as long as a deck of cards has the proper mathematical qualities, it can be used to play Poker. In fact, as long as the game "cards" have the right kind of 4 x 13 information and can be randomized (shuffled), distributed (dealt), and properly kept hidden when necessary (in a hand), they would not have to be cards at all. They could be, for example, carefully marked Popsicle sticks. It would be possible to play a game of "Poker" that would not resemble Poker on the surface, and might not be recognized as Poker by observers, but would still possess the formal structure of Poker.

How is this possible? When we talk about the rules of a game—the formal identity of a game—we are not referring to aesthetic qualities (such as the names of the suits) or representational identity (such as its ability to be recognized by an observer). We are limiting the focus to the set of rules, or formal structures that constitute the game. Looking purely at the rules of a game means repressing many other fascinating qualities of game play and game culture. This is not an easy thing to do. But as we will see, the rules of games are among their most unique features and deserve careful study—analytic study that can be of great benefit in solving game design problems.

Rules and Strategy

One note of clarification about the difference between the rules of a game and rules of strategy: rules as we understand them here as the formal structure of a game are not the same thing as strategies for play, even though the two might seem similar.

While playing Tic-Tac-Toe, you might devise a "rule of thumb" to assist your play. For example, if your opponent is about to win, you need to place a mark that will block your opponent. This kind of strategic "rule" is an important aspect of games (for example, you might use rules like this to program a computer opponent for a Tic-Tac-Toe game), but these rules of strategy are not part of the formal rules of the game. The actual game rules are the core formal system that constitutes how a game functions. Rules that help players perform better are not a part of this formal system.

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Other Kinds of Rules

Often, when we investigate a particular quality of games, we compare them to other forms of culture. Comparison helps situate games within a broader context and also highlights the qualities of games that make them unique. One of our primary intentions is to understand what makes games distinctive and what makes game design unique as a field. But that does not mean that the only kind of comparisons to make are the ones that set games apart from everything else.

Case in point: in trying to figure out exactly what game rules are, it is helpful to ask, *Are rules unique to games?* The answer is both yes and no. There are certainly "rules and regulations" in many kinds of activities. For example, conventions of etiquette are behavioral rules; so are laws of a state or the international "rules" of war. A sign to "keep off the grass" communicates a rule, and so does a memo about a school policy that forbids cheating on tests. Some might define science by saying that it uncovers hidden rules of nature, that molecules, for example, obey certain rules when they combine. If rules are guidelines that guide and direct behavior, there are many contexts in which people or phenomena do seem to "follow the rules."

The word "rules," like the words "play" and "game," can be used in many different ways. For the purposes of game design, it is important to consider in what ways games make use of rules. Perhaps a better question than "Are rules unique to games?" is, "What is unique about the rules found in games?"

Games are artificial systems, separate in some way from ordinary life. The authority of game rules only holds sway within the limited context of the game. The laws of a state, on the other hand, permeate the lived experience of its citizens in a much less limited way. It is true that laws are a social construct, as are game rules. However, from a formal point of view, the artificiality of games keeps their rules from having an impact outside the magic circle of the game. As game designer and philosopher Bernard DeKoven states, "I consider a game to be something that provides us with a common goal, the achievement of which has no bearing on anything that is outside the game."

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Qualities of Rules

The rules of a game are absolutely binding and allow no doubt.—Johann Huizinga, Homo Ludens

Rules are what differentiate games from other kinds of play. Probably the most basic definition of a game is that it is organized play, that is to say rule-based. If you don't have rules you have free play, not a game. Why are rules so important to games? Rules impose limits—they force us to take specific paths to reach goals and ensure that all players take the same paths. They put us inside the game world by letting us know what is in and out of bounds.—Marc Prensky, Digital Game-Based Learning

What are game rules like? What sets them apart from other kinds of rules? How do they function in a game? Consider the following list of rule characteristics:

- **Rules limit player action.** The chief way that rules operate is to limit the activities of players. If you are playing the dice game Yatzee, think of all of the things you could do with the dice in that game: you could light them on fire eat them, juggle them, or make jewelry out of them. But you do not do any of these things. When you play a game of Yatzee, you follow the rules and do something incredibly narrow and specific. When it is your turn, you roll the dice and interpret their numerical results in particular ways. Rules are "sets of instructions," and following those instructions means doing what the rules require and not doing something else instead.
- **Rules are explicit and unambiguous.** Rules are complete and lack any ambiguity. For example, if you were going to play a board game and it wasn't clear what to do when you landed on a particular space, that ambiguity would have to be cleared up in order to play. Similarly, rules have to be totally explicit in what they convey. If you were play-ing baseball in an abandoned lot and a tree was being used as second base, ambiguities regarding what counted as second base could lead to a collapse of the game. What can you touch and still be on second base? The roots? The branches? Or just the tree trunk?
- **Rules are shared by all players.** In a game with many players all players share the same set of rules. If one player is operating under a set of rules different than the others, the game can break down. Take the abandoned lot base-ball game example. If one player thinks that touching a branch of the tree is legally touching second base, but another player thinks that only the trunk is the base and tags the runner when he is holding onto a branch of the tree, is the player "out"? When the disagreement is raised, the game grinds to a halt. For the situation to be resolved, allowing the game to continue, all players must come to a common understanding of the rules and their application within play. It is not enough that rules are explicitly and unambiguously stated: the interpretation of the rules must also be shared.
- **Rules are fixed.** The rules of a game are fixed and do not change as a game is played. If two players are playing a game of Chess and one of them suddenly announces a new rule that one of her own pawns is invulnerable, the other player would most likely protest this sudden rule improvisation. There are many games in which changing the rules is part of the game in some way; however, the way rules can be modified is always highly regulated. In professional sports, for example, changes to rules must pass through a legislative process by governing organizations. Even in games in which the rules are changed during play itself, such as the whimsical card game Flux (in which playing a card can change the overall game's goals and rules), the ways the rules change are quite limited and are themselves determined by other, more fundamental rules.
- **Rules are binding.** Rules are meant to be followed. Part of the "magic" of the magic circle is that the rules contain their own authority. The reason why the rules of a game can remain fixed and shared is because they are ultimately binding. In some games, the authority of the rules is manifest in the persona of the referee. Like the rules themselves, the referee has an authority beyond that of an ordinary player. If players did not feel that rules were binding, they would feel free to cheat or to leave the game as a "spoil sport."
- **Rules are repeatable.** Rules are repeatable from game to game and are portable between sets of different players. In a Magic: The Gathering tournament, all the players in the tournament follow the same rules when they square off against each other. Outside of the limited context of an individual tournament, the game rules are equally repeatable and portable. Although games often have "home rules," such as the many different versions of rules for the "Free Parking" space in Monopoly, these rule variants are just local variants on largely consistent rule sets. In any case, players must resolve

ambiguities between sets of "home rules" in order to play a game.

These qualities of rules are in operation whenever one plays a game. If any of these qualities are not in effect, the game system may break down, making play impossible. If rules are ambiguous, players must resolve the ambiguities before play begins. If rules are not binding, players won't respect their authority and might cheat.

The characteristics on this list constitute the qualities of rules. Describing rules in this way is quite a classical way of understanding games. It is possible, for example, to design a game in which players do not share the same rule set, and resolving this discrepancy is what the game is all about. Or perhaps you want to play a "practice game" with someone, and you won't be obeying all of the rules in order to learn how to play the game. Clearly, the authority of rules is not always strictly obeyed: cheating does happen. As we examine the rules of games from many different angles, some of these qualities may be called into question. But from a strictly formal point of view, these are the general characteristics of all game rules.

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Rules in Context

If you think all of this talk about fixed and authoritative rules makes games seem a bit constraining, you are right. Out of all of the possible forms of play, from casual Frisbee-tossing to playful lovemaking, there is something slightly stuffy about games. A completely open-ended game, where rules are constantly invented (such as the example of invulnerable pawns above) is probably not a game by our definition. Although game play can be freewheeling and highly spontaneous, there are other forms of play more improvisational than the play typically found in games. But there is a special kind of lucidity and intelligibility about games. "Real life" is full of ambiguities and partially known information, but that is one of the reasons why games as designed systems are artificial and distinct from daily existence. In ordinary life it is rare to inhabit a context with such a high degree of artificial clarity. These peculiar characteristics of games give rise to the wonderfully unique qualities of game experience. But experience comes into play in later chapters: let us return to rules.

From a formal, rules-based point of view, what does it mean to take part in a game? To play a particular game, players voluntarily submit to the game; they limit their behaviors to the specific restrictions imposed by the game rules. Once play begins, players are enclosed within the artificial context of a game—its magic circle—and must adhere to the rules in order to participate. If you are playing Candyland, who cares which plastic piece reaches the final space first? The other players do, of course. They are the ones who, like yourself, have stepped into the game's magic circle, a shared space of play created by the rules.

There is a vast gap between the rules of Candyland and the experience of the game in play. In the rest of the chapters within RULES, we begin to cross that gap by looking at how sets of rules become systems of play. A number of different game design schemas will assist in this task, as we consider games as systems of emergence, uncertainty, information, feedback, decision making, and conflict. We even consider games as systems of rules to be broken. But before leaping into these schemas, it is necessary to understand rules in and of themselves, as formal systems. In the next two chapters, we build a more concrete foundation for understanding exactly what rules are, including the rules of digital games.

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Summary

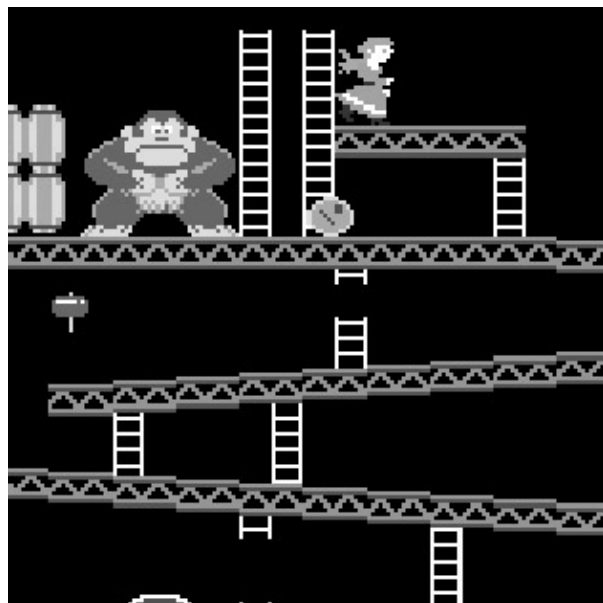
- **Rules** constitute the inner, formal structure of games. All games have rules, and rules are one of the defining qualities of games.
- Rules are not the experience of play. It is possible to make experiential changes to a game (such as changing the names of the four suits in a deck of cards) without changing the rules or formal structures of a game.
- Game rules as considered under the Primary Schema of **RULES** are different than rules of strategy. Strategic "rules of thumb" help players to play a game, but do not define the formal identity of a game.
- Game rules are different than the rules of etiquette, law, war, or other social rules. Games are intrinsically artificial and separate from "real-world" contexts, whereas these other forms of rules are not separate from ordinary life.
- Following are the general characteristics that all game rules share:
 - ♦ **Rules limit player action**
 - ♦ **Rules are explicit and unambiguous**
 - ♦ **Rules are shared by all players**
 - ♦ **Rules are fixed**
 - ♦ **Rules are binding**
 - ♦ **Rules are repeatable**
- Although some games question and violate these characteristics, these are the common traits of game rules considered from a strictly formal point of view.

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Chapter 12: Rules on Three Levels

Overview



*The "casual" game of tennis that my buddies and I play is really based on an enormously complex set of "rules"—assumptions, traditions, and conventions—that govern our behavior on the court (whether we are consciously aware of it or not).— **Stephen Sniderman**, "Unwritten Rules"*

*Consider the game of Chess. Typically it's played with a collection of Chess pieces on a chessboard consisting of black and white squares. We can all agree, I think, that these are indeed real-world objects. Moreover, the game involves a set of rules specifying how the pieces can move, what constitutes a legal position on the board, how one piece captures another and so forth. This is the real-world version of the game of Chess. But there is another version, one existing purely in the world of symbols and syntax (i.e., formal systems), and this version mirrors exactly the real-world game we normally see...the game of Chess is really a relationship between one set of abstract symbols (the black and white pieces) and another set of abstract symbols (the squares on the board). In short, there is nothing crucial about the material embodiment of these symbols insofar as the essentials of the game are concerned.— **John L. Casti**, *Complexification**

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Tic-Tac-What?

So far we have discussed rules in a relatively straightforward way. For example, we looked at the rules of Tic-Tac-Toe as they might appear in an instructions manual and argued that these rules fully constitute the rules of the game, the complete formal structure of Tic-Tac-Toe. Here are those rules one more time:

1. Play occurs on a 3 by 3 grid of 9 empty squares.
2. Two players alternate marking empty squares, the first player marking Xs and the second player marking Os.
3. If one player places three of the same marks in a row, that player wins.

- 4. If the spaces are all filled and there is no winner, the game ends in a draw.

Do these four rules constitute the complete formal system of Tic-Tac-Toe? Although these rules do describe to players what they need to know in order to play, there are aspects of the formal system of Tic-Tac-Toe that are not included here. Specifically, there are two kinds of formal structures that these four rules do not completely cover: the underlying mathematical structures of the game and the implied rules of game etiquette.

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Under the Hood

Let us explore these two kinds of formal structures one at a time. First, there is the foundational formal structure that lies "under the hood" of the rules of Tic-Tac-Toe. Does such a structure exist? Is it different than the stated rules of play? There is, in fact, a core mathematical logic that is part of every game but that is not necessarily expressed directly in the stated rules of the game that a player must learn. To understand this point, take a look at a game thought experiment by Marc LeBlanc. The game is called 3-to-15.^[1]

Rules for 3-to-15:

- 1. Two players alternate turns.
- 2. On your turn, pick a number from 1 to 9.
- 3. You may not pick a number that has already been picked by either player. If you have a set of exactly 3 numbers that sum to 15, you win.

What does this game have to do with Tic-Tac-Toe? At first glance, 3-to-15 doesn't seem anything like Tic-Tac-Toe. Instead of making Xs and Os, players are picking numbers. There is not even mention of a grid. However, the "punch line" of the game is that 3-to-15 is in fact a kind of Tic-Tac-Toe. If you think you have it figured out, look at the diagram across the page.

3-to-15 is a "magic square" puzzle, in which the numbers in any horizontal, vertical, or diagonal row add up to 15. By picking numbers from the magic square in the fashion proscribed by the rules, players are actually playing a game of Tic-Tac-Toe. Or are they? What do the two games have in common? The underlying rules found in both Tic-Tac-Toe *and* 3-to-15 look something like this:

- Two players alternate making a unique selection from a grid array of 3 by 3 units.
- The first player to select three units in a horizontal, vertical, or diagonal row is the winner.
- If no player can make a selection and there is no winner, then the game ends in a draw.

These "rules" resemble both the rules of Tic-Tac-Toe and 3-to-15, with some significant differences. For example, the rules don't mention how the player makes a selection from the array of choices, or how to record a player's action. The rules above are a kind of abstraction of both games.

Questions remain: is 3-to-15 a variant of Tic-Tac-Toe or a different game entirely? If it is a different game, what does it share with Tic-Tac-Toe? What does all of this say about the "rules" of Tic-Tac-Toe? We answer these questions later in this chapter. For the time being, just note that there are in fact formal aspects of games such as Tic-Tac-Toe that lie underneath the stated "rules of play."

The Punch Line

2	9	4
7	5	3
6	1	8

The punch line

[1] Marc LeBlanc, Game Developers Conference 2000.

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Being a Good Sport

If there are aspects of the formal systems of games that underlie the rules as they are expressed to players, there are also aspects of a game that lie beyond or outside the stated rules. These rules are rules of behavior that are implied but usually not explicitly stated in a game. Take a look again at the four "rules" of Tic-Tac-Toe.

1. Play occurs on a 3 by 3 grid of 9 empty squares.
2. Two players alternate marking empty squares, the first player marking Xs and the second player marking Os.
3. If one player places three of the same marks in a row, that player wins.
4. If the spaces are all filled and there is no winner, the game ends in a draw.

Does that really cover every possible rule of Tic-Tac-Toe behavior? Not really. There are other rules that players observe as well. In his essay "Life of Games," Stephen Sniderman points out one of these rules: the implied time limit between turns in Tic-Tac-Toe:

Is there a time limit between moves? Normally, we both "understand" that there is, and we both "know" that our moves should be made within a "reasonable" time, say 20 seconds. If one of us takes longer, the other starts to fidget or act bored, maybe even make not-so-subtle comments, and eventually threatens to quit. Without having stated it, we have accepted a tacit time limit. And because we haven't stated it, it is fairly flexible and very functional.

Suppose it is my turn and, no matter what I do, you will win on your next move. Couldn't I prevent that from happening, within the rules stated, by simply refusing to play? Nothing in the rules forces me to move within a particular amount of time, so I simply do not make my next move. Haven't I followed the rules and avoided losing? And yet, if you've ever played a game, you know that this strategy is almost never employed and would be completely unacceptable. Anybody who seriously resorted to such a tactic would be considered childish or unsportsmanlike or socially undesirable and would probably not be asked to play in the future. This behavior seems to violate some fundamental but rarely stated principle of the game without any of us ever having to discuss it.^[2]

There are plenty of other "unwritten rules" besides the self-imposed time limit on turns. For example, it is generally agreed that players will play Tic-Tac-Toe in a way that allows them to easily make Xs and Os. This is why most games take place by marking a piece of paper instead of picking blades of grass out of a large section of land, or making chalk marks on the asphalt of a dangerously busy superhighway—the conditions of play in these cases would make for a nearly impossible game. Other unwritten rules assume that players will

not tickle each other, hide the gameboard, or take other actions that prevent their opponents from taking a turn. These rules are implicit in some way in the four stated "rules." But if every possible implicit rule had to be listed, the list would be infinite.

[2]Stephen Sniderman, "The Life of Games." <www.gamepuzzles.com/tlog/tlog2.htm>.

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Three Kinds of Rules

As the example of Tic-Tac-Toe demonstrates, in order to fully understand the formal operation of a game, we need to complexify our understanding of game rules. We propose a three-part system for understanding what game rules are and how they operate.

Operational Rules

Operational rules are the "rules of play" of a game. They are what we normally think of as rules: the guidelines players require in order to play. The operational rules are usually synonymous with the written-out "rules" that accompany board games and other non-digital games. The operational rules of Tic-Tac-Toe are the four rules we initially presented.

Constitutive Rules

The constitutive rules of a game are the underlying formal structures that exist "below the surface" of the rules presented to players. These formal structures are logical and mathematical. In the case of Tic-Tac-Toe, the constitutive rules are the underlying mathematical logic that Tic-Tac-Toe shares with the game 3-to-15.

Implicit Rules

Implicit rules are the "unwritten rules" of a game. These rules concern etiquette, good sportsmanship, and other implied rules of proper game behavior. The number of implicit rules of Tic-Tac-Toe is vast and cannot be completely listed. The implicit rules of Tic-Tac-Toe are similar to the implicit rules of other turn-based games such as Chess. However, implicit rules can change from game to game and from context to context. For example, you might let a young child "take back" a foolish move in a game of Chess, but you probably wouldn't let your opponent do the same in a hotly contested grudge match.

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The Rules of Chutes and Ladders

So much for the simplicity of rules. Now that we have taken a closer look at the formal structure of Tic-Tac-Toe, it is clear that the phenomenon of game rules is more complex than it initially appeared. Let us continue our investigation of three kinds of rules by turning to the board game Chutes and Ladders. The printed rules of the game read as follows:

How to Play:

1. Everyone spins the spinner. The player with the highest number goes first. Play proceeds to the left.
2. *What to Do on Your Turn:* On your turn, spin the spinner and move your pawn, square by square, the number shown on the spinner. For example, on your first turn, if you spin a 5, move to "listitem">

Two or more pawns may be on the same space at the same time.

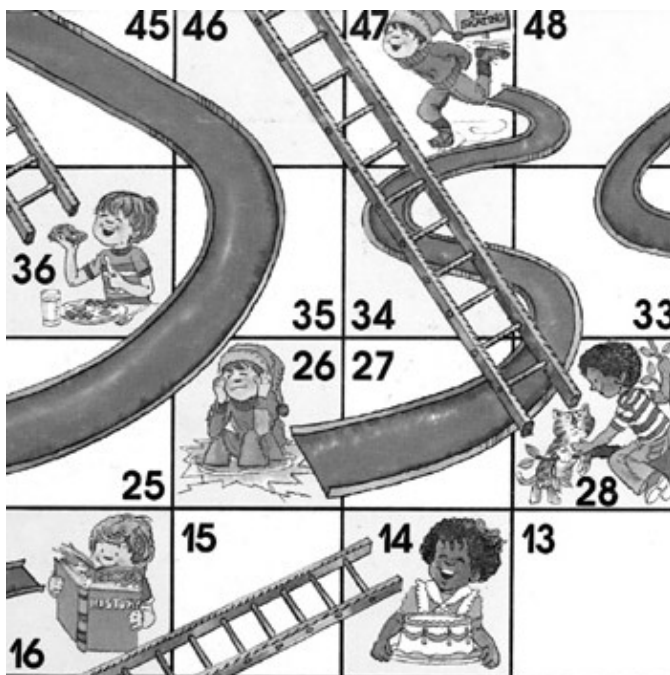
3. *Going Up or Down a Chute or Ladder:* Any time a pawn ends its move on a picture square at the bottom of a ladder, that pawn must climb up to the picture square at the top of the ladder.... *Chutes:* Any time a pawn ends its move on a picture square at the top of a chute, that pawn must slide down the chute to the picture square at the bottom of the chute.
4. If your pawn ends its turn on any of the following spaces, your turn is over:

- ◆ a square with no picture
- ◆ a square with no picture and just an arrow
- ◆ a square that a ladder or chute just passes through
- ◆ a picture square at the top of the ladder
- ◆ a picture square at the bottom of a chute

Winning the Game:

The first player to reach the Blue Ribbon square #100 wins the game. You can get there two ways:

1. Land there by exact count. If your spin would take you past square #100, don't move. Try again on your next turn.
2. Climb there by ending your move on ladder square #803.^[3]



Chutes and Ladders

Although these aren't the complete printed rules that accompany the game (the official rules include a narrative introduction and a Setup section), they give us the information that we need for our formal analysis. How do these printed rules relate to the operational, constitutive, and implicit rules of the game?

Chutes and Ladders: Operational Rules

Like most rules that are written out as instructions for players, the printed rules of Chutes and Ladders consist primarily of operational rules. The operational rules are explicit instructions that guide the behavior of players. How to Play rule number two, for example, tells players: "On your turn, spin the spinner and move your pawn, square by square, the number shown on the spinner."

This is an overt instruction that engages directly with the materials of the game. Because the physical materials of a board game allow players to interact with the game system, it is important for the operational rules to delineate precisely how a player is to manipulate and interpret the objects of a game. The rule mentions the spinner, pawn, and squares of the board, outlining in a single statement the core mechanism of play.

Chutes and Ladders: Constitutive Rules

The primary concern of the operational rules of a game is guiding the behavior of players. In contrast, the constitutive rules of a game—the underlying mathematical structure—exist independently from the player. Whereas operational rules are concrete and describe specific actions that players will take, the constitutive rules are abstract. Constitutive rules are sets of logical relationships that are not necessarily embodied in a material form or in a set of behavioral guidelines for the player. Constitutive rules literally have their own logic, which does not explicitly state how a player will make use of them.

What are the constitutive rules of Chutes and Ladders? They might look something like this:

1. Players all begin with a value of zero.
2. Players alternate turns adding a random number of 1–6 to their current value.
3. The first player to reach a value of exactly 100 wins (if adding the random number to a player's total would make the total exceed 100, do not add the random number this turn).
4. When a player's total exactly reaches certain numbers, the total changes. For example, if a player reaches exactly 9, her total becomes 31. If a player reaches exactly 49, her total becomes 11. (This rule covers the "chutes" and "ladders" of the game. For a true set of constitutive rules, this rule would have to be expanded to include all of the possible "chute" and "ladder" number adjustments for the particular edition of the game.)

Notice that in these rules, there is no mention of a spinner, a board, or pawns. There is no mention of how players are supposed to generate random numbers or to keep track of their numbers during the game. These mechanisms, which involve particular materials and behaviors, are part of the operational rules of the game.

How do the constitutive rules relate to the operational rules? Is there a one-to-one relationship? As a thought experiment, we could use these same four constitutive rules to invent new sets of operational rules that differ from the standard Chutes and Ladders game. Say that we wanted to change only the way that players generated the random number on their turn and the way that they kept track of their progress. Here are a few of the many different ways we could redesign the game:

- *Die and Scoresheet.* Players keep track of their total by writing numbers on a scoresheet and roll a die to generate a random number.
- *Cards and Chips.* Players keep track of their total by taking chips from a central pool and they pick from a set of six shuffled cards to generate a random number.
- *Spinner and Pegs.* Players move pegs along a linear track, using pawns to keep their place. Players use a spinner to generate a random number.

Each of these three games would have its own set of operational rules, which would vaguely resemble the original rules of Chutes and Ladders, but the rules would have to be adjusted to take into account the new materials and behaviors we introduced. For each game, we would have to provide an informational sheet for

players to track all of the forward and backward jumps, which in the original game take the form of "chutes" and "ladders" graphically depicted on the board.

These three games all require players to behave differently. Each one creates a different experience for players: rolling a die is a different action than drawing a card. Despite these differences, they all still share the same set of underlying constitutive rules. There is not, therefore, an intrinsic relationship between a game's operational and constitutive rules. The same set of constitutive rules can be expressed in many different operational forms.

Chutes and Ladders: Implicit Rules

Let us turn to our third kind of rules, the implicit rules of a game. There are many implicit rules of Chutes and Ladders. For example, the implicit rule we pointed out in Tic-Tac-Toe relating to the time players should take between turns also applies here. But there are other implicit rules of Chutes and Ladders too. Some of them are even included in the printed game rules. Below is the Setup section from the game's rule booklet:

1. Position the gameboard so that all the players can easily move their pawns from square to square.
2. *All About the Squares:* Take a peek at the gameboard. The squares are numbered from 1 to 100. Players' pawns will move back and forth across the board, following the numbers upward—starting at square "listitem">

Everyone chooses a pawn to play. Any extra pawns are out of play. Chosen pawns are placed off the board near square #1. Now get ready for the fun! ^[4]

Although these rules might seem obvious, they help illustrate some of the implicit rules of Chutes and Ladders. Setup rule number 1 is a classic example of an implicit rule, here made explicit in the printed text. The gameboard must be positioned so that everyone can access it—in other words, it is necessary that everyone be able to physically and logistically enact the operational rules. The Setup rule that instructs players to put extra pawns out of play (leaving them outside the game) is another rule that is usually implicit, but happens to be written out here.

In the case of these two rules, a normally implicit rule is made an explicitly stated, operational rule through its listing in the rules that come with the game. For Chutes and Ladders' audience of young players, the game designers seemed to think that it was necessary in these cases to spell out what is usually implicit. And because the potential number of implicit rules is infinite, there are many other implicit rules that might be stated as well. Which ones should you include when you are writing instructions, manuals, or help sections for a game? It all depends on your audience and the kind of experience you want the participants to have. Ultimately, sets of rules and instructions need to be designed, analyzed, tested, and revised just as other aspects of a game.

For the purposes of our formal analysis, what does it mean to call these written rules "implicit rules"? If a rule is explicitly written out, how can it possibly be implicit? The boundary between operational and implicit rules can be quite fuzzy. Often, a "rule of play" can shift from implicit to operational, depending on the context. To return to our earlier example of the abandoned lot baseball game, the rule about the tree trunk (and not the branches or roots) being second base could be an implicit rule for a group of kids that have a lot of common experience playing baseball in places where trees are used as bases. However, a newer player might need this implicit rule spelled out, at which point it would become an explicit, operational rule.

The value of this three-part rules model is not in being able to definitively decide whether any given rule is constitutive, operational, or implicit. There will always be some games and game contexts that don't neatly fit into our model. Like all of the concepts in this book, these three ways of understanding rules is not presented as a definitive explanatory typology: it is offered as a framework for identifying, analyzing, and solving design problems as they arise in your game.

^[3]Milton Bradley, Chutes and Ladders.

^[4]Ibid.

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The Identity of a Game

Every game has its rules," says Huizinga in Homo Ludens. But we may go further, and say, "Every game is its rules," for they are what define it.—David Parlett, The Oxford History of Board Games

By now we have a grasp on the constitutive, operational, and implicit rules of Chutes and Ladders. Here is a question: which of these sets of rules are *really* the rules of Chutes and Ladders? Which set of rules are the true rules of the game? The answer is not obvious. In looking at Chutes and Ladders, we identified the constitutive rules, but these rules can also be used to make other games, such as the Die and Scoresheet game. The operational rules seem unique to Chutes and Ladders, but aren't they only an expression of the more fundamental constitutive rules? The implicit rules do not seem unique to Chutes and Ladders at all (they are shared with other board games), but at the same time, some of the implicit rules are written out in the instructions that come with the game. And what about game elements that aren't part of the rules: the name of the game, the visual design of the materials, the mini-narratives of punishment and reward that happen on the board, the history of the game's development, the demographic profile of its players? Do any of these attributes of Chutes and Ladders have a bearing on the game's formal identity?

We start with the last question first. We can define a game in many ways. In the chapters concerning **RULES**, however, the focus is not on the visual design, narrative content, cultural history, or social use of games. Instead, it is on game rules: the formal structures of a game. When it comes to deciding which rules are the "real" rules of the game, we can eliminate all of these non-rule aspects of Chutes and Ladders. Instead, we must look only at the three kinds of rules and decide, from a formal point of view, what constitutes the actual "rules" of Chutes and Ladders. What set of rules gives Chutes and Ladders its unique formal identity?

We can immediately eliminate implicit rules as a possible answer. Although the implicit rules of Chutes and Ladders are crucial to understanding how the game functions, by and large the implicit rules of the game are similar to the implicit rules of other games. Even if we were somehow able to list all of the game's implicit rules, it would not get us any closer to locating the unique formal identity of Chutes and Ladders.

This leaves the other two categories: operational and constitutive rules. It turns out that these two kinds of rules are both important in determining a game's uniqueness. The "true and unique identity" of the formal system of Chutes and Ladders (or any game) emerges from the interaction between these two sets of rules. At first glance, it might seem like the constitutive rules of a game are the "core" or "essence" of the game rules and the operational rules merely describe ways of accessing the constitutive rules. In fact, this is not the case. The constitutive and operational rules of a game work in concert to generate the formal "meaning" of a game. There is no "essence" of a game wrapped up in its logical, constitutive core.

Are we sure about this? Think back to the variations on Chutes and Ladders that shared the same constitutive rules. Those other game variations just did not feel like Chutes and Ladders—because they were *not* Chutes and Ladders. As much as the formal identity of a game is tied to its constitutive logic, the material way that players experience that logic, as proscribed by the operational rules, is equally important. The fact that players are rolling a die and moving pieces on a board is as much a part of Chutes and Ladders as the mathematical logic that those behaviors express.

If the gameboard and other materials are important, are they not part of the formal identity of the game? What happens if we remove the cute illustrations of boys and girls? What if we replace the illustrations of chutes and ladders with abstract arrows that point at the space where the player is supposed to go? Would the game still be Chutes and Ladders? From an experiential, play-based point of view, no. Removing these elements from the game changes the players' experience—players taking part in the game might not even recognize it as a "stripped down" version of Chutes and Ladders. However, even though the players might not realize it, from a formal point of view, they would be playing Chutes and Ladders. Formally, even with all of the illustrative graphics taken out, the rules of the game would remain the same. When it comes to defining the formal identity of a game, only the rules matter.

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Specificity of Rules

Let us take another look at the complex intersection of constitutive and operational rules. Is it really true that for any given game, there exists a single set of constitutive rules? Or are there many sets of constitutive rules we might apply to the same game? What if the constitutive rules of Chutes and Ladders were simplified in the following manner:

1. Players all begin with a value of zero.
2. Players alternate turns generating a number and adding it to their value.
3. The first player to reach a value of 100 wins.

Or simplified even further:

1. Players begin with a value of zero.
2. The first player to reach a value of 100 wins.

Or even further:

1. The first player to satisfy the victory conditions is the winner.

What is going on with these successive simplifications of the constitutive rules? With each stylization, we not only move farther away from Chutes and Ladders, but we also move farther away from a set of constitutive rules that could be contained within a particular set of operational rules.

Because the operational and constitutive rules together create the formal identity of a game, they must embody the qualities of rules we identified in the [previous chapter](#): explicit and unambiguous, as well as shared, fixed, binding, and repeatable. The vague sets of constitutive rules listed above don't meet these criteria: they are simply too general. A similar set of ambiguous operational rules could be created for Chutes and Ladders, such as by telling players to move on the board but not specifying exactly how they are supposed to move. As we know from earlier examples, ambiguity in operational rules leads to disagreements, which must be resolved before play can continue.

The specificity of the rules for any game allows us to identify the game, by saying that it is defined by *this* set of rules and not *that* set of rules. There is no absolute measure for the moment when the identity of one game ends and another begins. But the identity of the game is usually self-evident. So if identity is self-evident, why are we going through such trouble to pin it down? Because the formal identity of a game emerges from the intersection of its constitutive and operational rules, understanding how it operates will help us understand how rules construct a game.

The operational rules are not merely an expression of the constitutive rules of a game. The relationship is more of a two-way street. Operational rules are concrete, real-world rules. Constitutive rules are abstract, logical rules. They are very different, but every game ties them together tightly by virtue of its unique identity. What is the relationship between these two kinds of rules? Mathematician John Casti sheds some light on the problem:

Given a particular kind of mathematical structure, we have to make up a dictionary to translate (i.e., interpret) the abstract symbols and rules of the formal system into the objects of that structure. By this dictionary-construction step, we attach a meaning to the abstract, purely syntactic structure of the symbols and strings of the formal system. Thereafter, all of the theorems of the formal system can be interpreted as true statements about the associated real-world objects.^[5]

Casti is not talking about games (he is discussing the relationships between purely formal systems such as math and the objects that those formal systems name and manipulate). But his thinking is relevant here. In the kinds of systems he describes, there is interpretation between the two levels of a structure, an interpretation that produces meaning as translation occurs between the levels. This same process occurs across all three levels of a game's rules. The formal meaning of a game is dependent on the intertwined constitutive, operational, and implicit rules. How we make sense of a game relies on their interaction, as one form of rules allows for the expression of the others. The significance of rules as a system of expression arises out of the interdependence of its parts. Within the magic circle of a game, formal structures acquire meaning by virtue of these interrelationships.

^[5]John Casti, *Complexification: Explaining a Paradoxical World Through the Science of Surprise* (New York: HarperCollins Publishers, 1994), p. 123.

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Designing Elegant Rules

It is curious to realize that when players move pawns or tokens along a track (as in Chutes and Ladders) their action is really just a different way of keeping score. Conversely, any game in which players display or record a numerical score could also be realized as a race game, with representations of the players moving along a track. Why should a game choose one operational form over another? Why should Chutes and Ladders be played on a board if it could also be played in other ways? Can we use the framework of game rules to help make these kinds of design decisions?

As a game designer you generally want players focused on the experience of play, rather than on making sense of the rules. One important aspect of designing rules is creating experiences where elegant rule design maintains proper player focus.

Rules in the Design Process

What do rules have to do with design? Are we advocating that game designers create their games by thinking explicitly in terms of constitutive, operational, and implicit rules?

First of all, there is no magic formula for designing meaningful play. There are as many approaches to creating games as there are game designers. As a game designer, you might be driven by a desire to explore

storytelling, visual aesthetics, social interaction, new technologies—or even new kinds of formal rules.

Despite all of these possible approaches, there is something intrinsically structural about games. Even if you are not focused on rules as the creative inspiration for your game design process, you are still going to have to create a set of rules in order to design your game. This means that looking at games formally—as a system of rules—will ultimately be an important part of knowing how your game works. Understanding the formal qualities of games is just as important as understanding their experiential and cultural aspects.

More than a procedure for designing games, the three kinds of rules provide a framework for understanding how rules operate. As a game designer, the systems you're building through the iterative process of game design will have rules as one of their raw materials. Designing and re-designing game systems means, on some level, tinkering with rules. Understanding how rules operate makes it much easier to design meaningful play.

In Chutes and Ladders, there are many reasons why the game takes place on a board, with players moving pawns, instead of, for example, players keeping score on a piece of paper. One reason is the game's audience. Children use the squares to help them count. Instead of adding 6 to 57 on a sheet of paper, they can simply count up six squares to arrive at their new location on the board.

More importantly, however, the board takes care of that pesky constitutive rule number four, the rule that embodies "climbing" and "sliding." If the players are keeping score on paper, all of the jumps up and down have to be recorded on a separate sheet for reference. The elegance of the gameboard is that it combines these two operational functions, at once the marker for progress as well as the reference for climbing and sliding. This makes for a successful game experience. Meaningful play emerges from a tight coupling of action and outcome: a *discernable* and *integrated* outcome. The use of a gameboard in the process of generating a random number, recording progress, and seeing whether or not your token climbs or slides, helps emphasize the meaning of the game in a number of ways:

- The board contains all aspects of the game information— progress toward the end space as well as climbing and sliding—at once.
- The representations of the players (their tokens) are all in the same "space," making comparison of relative positions immediate and intuitive.
- Players can clearly see the consequences of their actions, whether it is moving normally during a turn, climbing, or sliding.

It is easy to take the elegance of a game such as Chutes and Ladders for granted. Compare it with a game in which the operational rules make the game *more* difficult to play. Remember Marc LeBlanc's Tic-Tac-Toe variant 3-to-15? The problem with 3-to-15 is that by picking numbers instead of making marks, players cannot see the implications of their actions. Unless players are able to keep a crystal-clear picture of the magic square puzzle in their heads (as well as remember all of the past moves of the game), they will not be able to use the kind of strategies we normally think about when playing Tic-Tac-Toe. 3-to-15 becomes a game about memory and math, instead of the very simple territorial conflict that is Tic-Tac-Toe. If memory and math were what the designer intended to emphasize, then fine. But if your intention is to have players strategically plot their moves on a grid as they play, the operational rules of Tic-Tac-Toe are far superior to those of 3-to-15.

The idea of elegance through clarity works for Chutes and Ladders given its audience of young children, their limited attention and math skills, and the way that the operational rules of the game create an overall experience. However, it is easy to think of games in which the same kind of clarity of information could destroy the game. Imagine, for example, a game of Assassin in which all of the players know everything about each other, such as where they live and who has been assigned to which targets. Assassin is a game that requires secrecy, confusion, and hidden information. Having too much information destroys these elements, making clarity of information an undesirable quality of game play. However, the ways that players learn the game itself—how to enter the system of secrecy, confusion, and hidden information—has to be clear. Rules

themselves must ultimately be unambiguous.

When a game creates ambiguity, it is always within some larger frame that is clearly articulated and shared by all players. Creating that clear ruleset and tying it to the actions and outcomes of genuinely meaningful play is one way of understanding the entire process of game design. Understanding how constitutive, operational, and implicit rules work together in your game is a key element of this process.

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Further Reading

"The Life of Games," by Stephen Sniderman

In this online essay, Sniderman takes a philosophical look at the "unwritten" rules of games. This is the essay from which we derive our understanding of implicit rules, and in it Sniderman makes a number of strong connections between game play, etiquette, and larger notions of cultural behavior. It can be found online at: www.gamepuzzles.com/tlog/tlog2.htm.

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Summary

- The rules of any game exist on three related levels: constitutive rules, operational rules, and implicit rules.
 - ◆ **Constitutive rules** are the abstract, core mathematical rules of a game. Although they contain the essential game logic, they do not explicitly indicate how players should enact these rules.
 - ◆ **Operational rules** are the "rules of play" that players follow when they are playing a game. Operational rules direct the players' behavior and are usually the kinds of rules printed out in instructions and rulebooks for games.
 - ◆ **Implicit rules** are the "unwritten rules" of etiquette and behavior that usually go unstated when a game is played. Similar implicit rules apply to many different games.
- The operational rules for any particular game build directly on that game's constitutive rules. However, any given set of constitutive rules can be expressed in many different operational forms.
- There is a fuzzy boundary between operational and implicit rules. For example, sometimes a game designer may make certain implicit rules explicit by including them in the printed rules of a game.
- The **formal identity** of a game allows us to distinguish a game as formally unique and distinct from other games. This identity emerges from the relationship between the game's constitutive rules and operational rules.
- Key in establishing the formal identity of a game is the **specificity** of the rules. The exact and unambiguous nature of the constitutive and operational rules allow a game to be **this** game and not **that** game.
- There is a translation that occurs among the constitutive, operational, and implicit rules of a game. The magic circle is the context for this translation. The formal meaning of a game emerges through a

process that bridges all three levels of rules in a game.

- **Elegant rules** allow players to focus on the experience of play rather than on the logic of the rules. Designing meaningful play involves building discernable and integrated relationships between action and outcome into all levels of the rules of a game.

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