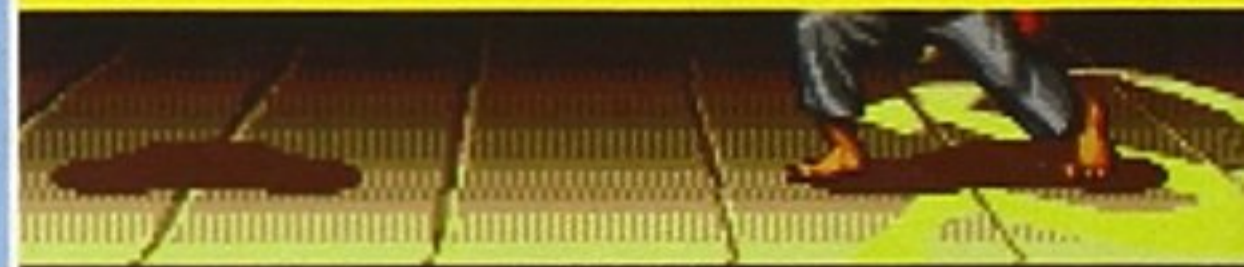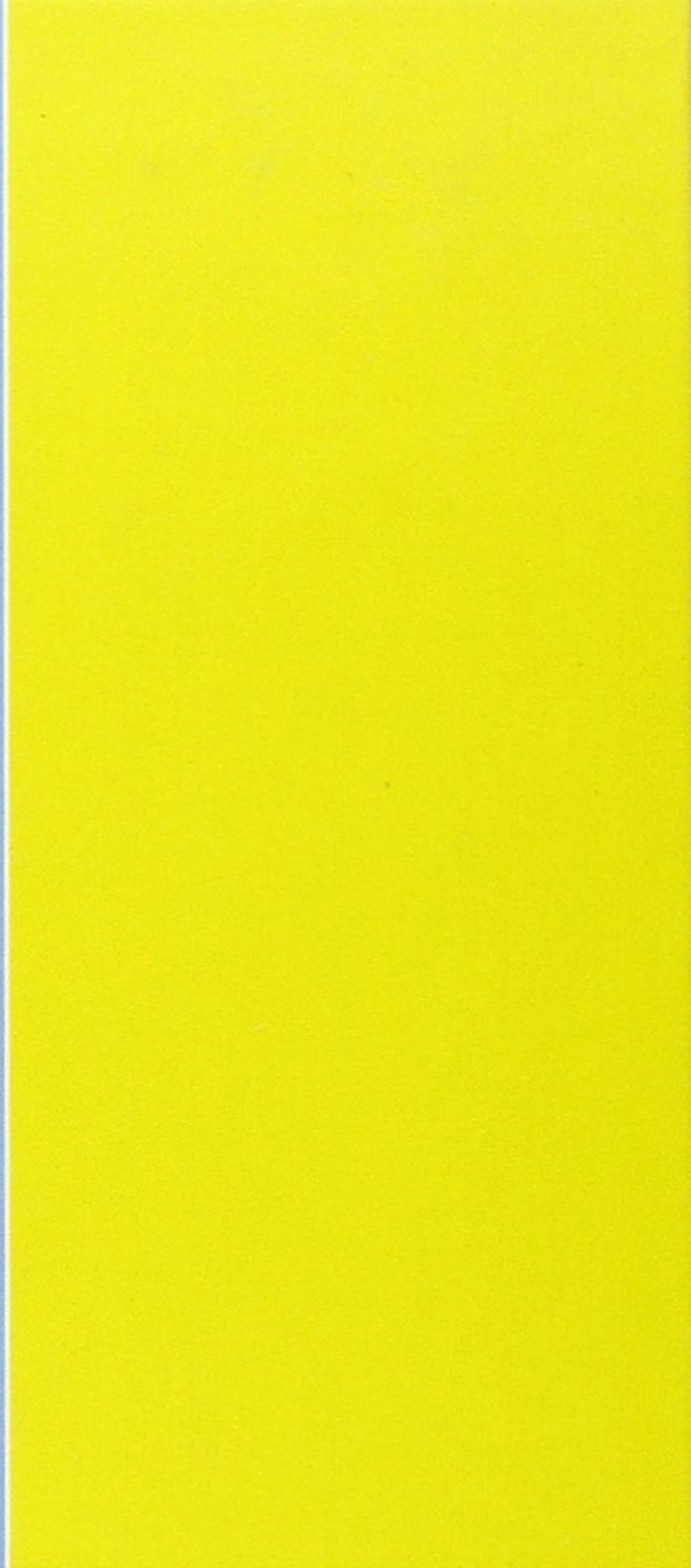Katie Salen | Eric Zimmerman

Rules of Play

Game Design Fundamentals

wheels turn in his mind as Fred develops his response to Joe's statement.

Step Three: Fred expresses his response back to Joe. He forms his thoughts into words and speaks them.

Now the tables are turned; the ball is in Joe's court. Joe must listen to what Fred says; Joe must think about it and develop a reaction; then he must express his reaction to Fred.This process cycles back and forth. Thus, a conversation is an iterative process in which each participant in turn listens, thinks, and speaks.[6]

Each of these definitions provides its own critical way of understanding interactivity: it takes place within a system, it is relational, it allows for direct intervention within a representational context, and it is iterative. Yet none of the definitions describes how and where interactivity can take place, and none of them address the relationship between structure and context, two key elements in the construction of meaning. These questions of the "how,""where," and "by whom" are critical to anyone faced with the challenge of designing interactivity.

In other words, none of these definitions resolve the question of whether or not all media, or even all experiences, are interactive. If interactivity is really so ubiquitous, can it possibly be a useful term for understanding games?

[1]<dictionary.com>.

[2]Stephen W. Littlejohn, *Theories of Human Communication,* 3rd edition (Belmont, CA: Wadsworth Publishing Company, 1989), p. 175.

[3]Brenda Laurel, *Computers as Theater* (Reading, MA: Addison-Wesley Publishing Company, 1993), p. 112.

[4]Andy Cameron, *Dissimulations: Illusions of Interactivity* (MFJ No. 28: Spring 1995), <http://infotyte.rmit.edu.au/rebecca/html/dissimula-tions. html>.

[5]Chris Crawford, *Understanding Interactivity* (San Francisco: No Starch Press), 2002, p. 6.

[6]Ibid; p. 7.

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A Multivalent Model of Interactivity

Each of the previous definitions foreground a particular aspect of interaction; in our view, they are all are useful ways of defining interactivity. Rather than try and distill them into a composite definition, we have elected instead to offer a model of interactivity that accommodates each of these definitions. The model presents four modes of interactivity, or four different levels of engagement, that a person might have with an interactive system. Most "interactive" activities incorporate some or all of them simultaneously.

Mode 1: Cognitive interactivity; or interpretive participation

This is the psychological, emotional, and intellectual participation between a person and a system. Example: the complex imaginative interaction between a single player and a graphic adventure game.

Mode 2: Functional interactivity; or utilitarian participation

Included here: functional, structural interactions with the material components of the system (whether real or virtual). For example, that graphic adventure you played: how was the interface? How "sticky" were the buttons? What was the response time? How legible was the text on your high-resolution monitor? All of these elements are part of the total experience of interaction.

Mode 3: Explicit interactivity; or participation with designed choices and procedures

This is "interaction" in the obvious sense of the word: overt participation like clicking the non-linear links of a hypertext novel, following the rules of a board game, rearranging the clothing on a set of paper dolls, using the joystick to maneuver Ms. Pac-Man. Included here: choices, random events, dynamic simulations, and other procedures programmed into the interactive experience.

Mode 4: Beyond-the-object-interactivity; or participation within the culture of the object

This is interaction outside the experience of a single designed system. The clearest examples come from fan culture, in which participants co-construct communal realities, using designed systems as the raw material. Will Superman come back to life? Does Kirk love Spock?

Some of these modes occur universally in human experience, such as Mode 1, cognitive interactivity. Yet not all of them do. For our purposes, Mode 3, explicit interactivity, comes closest to defining what we mean when we say that games are "interactive." An experience becomes truly interactive in the sense of Cameron's "direct intervention" only when the participant makes choices that have been designed into the actual structure of the experience.

The rest of this chapter focuses primarily on explicit interactivity and how game designers can create the kinds of choices that result in meaningful play. However, even though we will be focusing on Mode 3, it is important to remember that the other three modes of interactivity are also present as players make explicit choices. For example, choosing whether to fold or not in Poker represents a moment of explicit interactivity. But at the same time, the material quality and size of the cards affect the functional interactivity; the fanciful images on the face cards might engender cognitive interactivity; and notions about what it means to be a suave card shark-or perhaps resentment at being trounced at the Poker table last week-represent forms of cultural participation that lie outside the bounds of the particular game being played.

Interaction, even the explicit interaction of a seemingly straightforward game choice, is never as simple as it appears at first glance. But before we dissect the components of explicit interactive choices, let's pause to consider the role of design itself in creating interactivity.

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But Is it "Designed" Interaction?

Interaction comes in many forms. But for the purposes of designing interactivity, it is important to be able to recognize what forms of interactivity designers create. As an example, compare the following two actions: someone dropping an apple on the ground and someone rolling dice on a craps table. Although both are examples of interaction proper, only the second act, the rolling of the dice, is a form of designed interaction.

5. How is the result of the choice conveyed to the player? (external event)	The result of the choice is then represented to player via screen graphics and audio.	The result of the choice is then represented to the player via the new arrangement of pieces on the board.

Figure 1:

Although all five stages of the action > outcome choice event occurred in both games, there are some significant differences. In Asteroids, the available choices and the taking of an action both involve static physical controls. In Chess, the pieces on the board serve this function, even as they convey the current state of the game. The internal and external states of Chess are identical, but in Asteroids, what appears on the screen is only an outward extension of the internal state of the software. The "anatomy of a choice" structure occurs in every game, although each game will manifest choice in its own way.

This way of understanding choice in a game can be extremely useful in diagnosing game design problems. If your game is failing to deliver meaningful play, it is probably because there is a breakdown somewhere in the action > outcome chain. Here is a sample list of common "failure states" that can often be found in games and the way that they relate to the stages of a choice.

- *Feeling as if decisions are arbitrary.* If you need to play a card from your hand and it always feels like it doesn't matter which card you select, the game probably suffers in stage 4, the effect of the player's choice on the system of the game. The solution is to make sure that player actions have meaningful outcomes in the internal system of the game.
- *Not knowing what to do next.* This can be a common problem in large digital adventure games, where it is not clear how a player can take action to advance the game. The problem is in stage 2, representing choices to the player. These kinds of problems are often solved with additional information display, such as highlights on a map, or an arrow or indicator that helps direct the player.
- *Losing a game without knowing why.* You think that you're about to reach the top of the mountain, when your character dies unexpectedly from overexposure. This frustrating experience can come about because a player has not sufficiently been informed about the current state of the game. The problem might be in stage 5, where the new state of the game resulting from a choice is not represented clearly enough to the player.
- *Not knowing if an action had an outcome.* Although this sounds like something that would never happen, there are many examples of experimental interactivity (such as a gallery-based game with motion sensor inputs) in which the player never receives clear feedback on whether or not an action was taken. In this case, there is a breakdown at stages 3 and 4, when a player is taking an action and receiving feedback on the results.

These examples represent only a small sampling of the kinds of problems that a game's design can have. The anatomy of a choice is not a universal tool for fixing problems, but it can be especially useful in cases where the game is breaking down because of a glitch in the player's choice-making process.

[8]Jesper Juul, Computer Games and Digital Textuality. Conference at IT University of Copenhagen, March 1-2, 2001.

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Space of Possibility

We conclude this chapter with an excerpt from David Sudnow's book, *Pilgrim in a Microworld,* a wonderfully detailed personal account of one man's very real obsession with the video game Breakout. Sudnow brings readers into the space of designed interactivity through detailed descriptions of what he

experi-enced-physically, psychologically, emotionally-as he played. There are remarkably few documents that offer such a sensitive and insightful analysis of designed interaction.

> I'd catch myself turning my chair into a more en face position vis-à-vis the TV. An obvious delusion. Maybe I could rest one elbow on the set to help feel the angle of my look and deepen a sense for the scale of things. See it from this side and that, see the invisible backside of things through an imaginary bodily tour of the object. Nonsense. If only I could feel the impact of the ball on the paddle, that would certainly help, would give me a tactile marker, stamping the gesture's places into a palpable little signature so I'd feel each destination being achieved and not just witness the consequences of a correct shot. Nonsense.

> Non-sense, just your eyes way up top, to be somehow fixed on things in ways that can't feel them fixing, then this silent smooth little plastic knob down there, neither near nor far away but in an untouchable world without dimensions. And in between all three nodes of the interface there's nothing but a theory of electricity. So fluid, to have to write your signature with precise consistency in size within the strict bounds of a two and three-sevenths of an inch of space, say, while the pen somehow never makes contact with the paper. There's nothing much to hold on to, not enough heft in this knob so your hands can feel the extent of very minor movements, no depth to things you can use to anchor a sense of your own solidity. [9]

As game designers, what can we glean from Sudnow's observations? His analysis suggests that there is a wealth of information to be gained about a game's interactivity by looking at it from the player's point of view. One of our disappointments with current writing on games and interactivity is that much analysis occurs not from the point of view of the player, but from the point of view of an outside spectator. This style of over-the-shoulder journalism fails to recognize that interactivity is something to be experienced, rather than observed. In writing a player-centric account of his encounter with the game, Sudnow calls attention to key concepts for designed interaction. Concepts such as directed choice, player control, amplification of input, system representation, and direct, visible feedback emerge in his poetic meditation on perception, attention, cognition, and the body.

Creating a game means designing a structure that will play out in complex and unpredictable ways, a space of possible action that players explore as they take part in your game. What possible actions might players take in the course of a game of Musical Chairs? They might push, shove, tickle, poke, or fight for their seat once the music stops and the mad scramble for chairs begins. The game designer must carefully craft a system of play in which these actions have meaning in support of the play of the game, and do not distract or interrupt its play.

But game designers do not directly design play. They only design the structures and contexts in which play takes place, indirectly shaping the actions of the players. We call the space of future action implied by a game design the *space of possibility*. It is the space of all possible actions that might take place in a game, the space of all possible meanings which can emerge from a game design. The concept of the space of possibility not only bridges the distance between the designed structure and the player experience, but it also combines the key concepts we have presented so far. The space of possibility is *designed* (it is a constructed space, a context), it generates *meaning* (it is the space of all possible meanings), it is a *system* (it is a space implied by the way elements of the system can relate to each other), and it is *interactive* (it is through the interactive functioning of the system that the space is navigated and explored).

The space of possibility springs forth out of the rules and structures created by the game designer. The space of possibility is the field of play where your players will explore and cavort, compete and cooperate, as they travel through the experience of playing your game. But like David Sudnow who wishes he could reach out and touch the electronic blip of his Breakout paddle, as a game designer you can never directly craft the possible space of your game. You only can indirectly construct the space of possibility, through the rules you design. Game design is an act of faith-in your rules, in your players, in your game itself. Will your game

create meaningful play? You can never know for sure. But understanding key concepts like design, systems, and interactivity can help bring you closer to a meaningful outcome.

[9]David Sudnow, *Pilgrim in a Microworld* (New York: Warner Books, 1983), p.177.

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Further Reading

Computers as Theater, by Brenda Laurel

Although Laurel is not speaking about games directly, her discussion of a dramatic theory of human-computer activity has many connections to the interactivity of games. The most relevant discussions to game design focus on the mechanics of interaction and the way people interact with machine interfaces.

Recommended:

Chapter 1: The Nature of the Beast

Chapter 5: Design Principles for Human-Computer Activity

The Design of Everyday Things, by Donald Norman

Norman's book is a must read for any designer involved in the design of interactive systems. His approach has been formalized more recently within the catch-phrase "experience design," which places the user at the center of any designed activity. Although Norman is writing about everyday objects such as telephones and car doors, his observations have direct application to the design of games as interactive systems.

Recommended:

Chapter 1: The Psychopathology of Everyday Things

Chapter 2: The Psychology of Everyday Actions

Chapter 3: Knowledge in the Head and in the World

"Designing Interactive Theme Park Rides: Lessons From Disney's Battle for the Buccaneer Gold," by Jesse Schell and Joe Shochet

In this design postmortem of one of Disney's interactive theme park rides, Schell and Shochet discuss the reasons for the ride's success. Their analysis is design-driven, and offers insight into the tools, techniques, and psychology used to create an effective and entertaining interactive experience. Available at <www.gamasutra.com>.

"Formal Abstract Design Tools," by Doug Church

In making one of the most robust arguments for the development of a common vocabulary for games, Doug Church establishes a precedent for critical thinking within the emerging field of game design. "Formal Abstract Design Tools" is written from a game design perspective and explores concrete concepts of interactivity in the design of player experience. Available at <www.gamasutra.com>.