Interpreting Abstract Games: The Metaphorical Potential of Formal Game Elements

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ABSTRACT

As cultural artifacts, abstract games offer unique challenges to critical interpretation. This is largely due to the fact that such games lack a fictional element: there are no characters, no settings, and no narratives to speak of. In this thesis I propose that understanding the various formal elements of games as metaphors can both serve as an effective critical method and offer insights into designing more expressive games.

I begin by addressing the ambiguity surrounding the phrase "abstract game" and offer a definition rooted in Peircean semiotics and Juul's model of games as consisting of both rules and fiction.

I next offer a model of games as consisting of three levels: the system, audio-visual, and affective. This is followed by an overview of Lakoff and Johnson's concept of "metaphor" as "understanding one thing in terms of another." I then argue that different types of metaphors have a natural affinity for the system and affective levels of games.

From this I develop methods for a critical method wherein games are considered to be metaphors. I conclude with a discussion of this method's implications for game design and future game research.

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0. Introduction

As artifacts, abstract games offer uncommon barriers to criticism. These games often appear to be little more than sets of seemingly arbitrary symbols or shapes that are manipulated or transformed according to equally arbitrary rules, and it can be difficult to see these games as anything but interesting little challenges. Part of this difficulty stems from the fact that these games are not obviously about someone or something in the way books, feature films and even other games are. For Ian Bogost this lack of "aboutness" – meaning whether the game is clearly about an idea, concept or theme – is a major barrier to interpretation:

> "Can we talk about such games the way we talk about, say, BioShock or Pac-Man or SimCity? All of those games offer aboutness of some kind, whether through narrative, characterization, or simulation. In each, there are concrete topics that find representation in the rules and environments. Indeed, it's hard to talk about abstract games precisely because they are not concrete. Those with more identifiably tangible themes offer some entry point for thematic interpretation" (Bogost 2009).

To look for "aboutness" solely within a game's fictional elements, however, is to overlook a significant and under-explored way that a game can be about something or have meaning. For example, when a game models another system through its rules and mechanics it can express an idea or make a claim about the source system (a topic Bogost himself has discussed extensively regarding non-abstract games in Persuasive Games, and I will discuss in Chapter 1). A similar effect can occur when the game creates an

experience that the player identifies as similar to an experience had elsewhere. Another example is when a game functions in a manner similar to another system, but that similarity was not intended by the designers.

In this thesis I will analyze in detail how the latter examples occur via metaphor, in the sense employed by George Lakoff and Mark Johnson. For Johnson, metaphor is "a process by which we understand and structure one domain of experience in terms of another domain *of a different kind*" (Johnson 15). Metaphor is about understanding one thing in terms of another, and I believe it can be a valuable basis for game design and game criticism. In the context of interpreting games, metaphorical projection occurs when the player finds meaning in a game by analyzing how the game is similar to another experience or system, which enables a deeper understanding of both. This projection is made possible by structural similarities between the two. While interpretation is an act of the player, and thus cannot be perfectly predicted, it is important to note that the formal properties of the game are essential to this process. Metaphorical projection is not about associating disparate objects or systems at will, but relies on systemic correlations. The advantage of this approach is that these correlations necessarily involve formal properties of the game and its constituent elements, which means that metaphorical interpretation can be designed for. These concepts will be discussed further in Chapter 3, "Metaphors."

To clarify how games can be interpreted metaphorically I will introduce a tripartite model of games in Chapter 2. In this model a game consists of three levels: the system, the audio-visual design, and the affective. I will then provide example

metaphorical interpretations of the affective and system levels of several abstract games. In this thesis I will not be addressing metaphorical interpretation of the audio-visual level, primarily for reasons of scope. I will discuss the complexities of this level in particular in Chapter 2.

This approach is significant for several key reasons. First, it enables us to locate meaning in abstract games, a possibility of paramount importance to understanding the strengths and potentials of games as an expressive medium. Abstract games are quite possibly the primordial game configuration; only recently in history have characters and stories become possible. Any general account of how games can express and communicate ideas must be applicable to abstract games. Furthermore, their simplicity and non-reliance on recognizable visual objects implies that techniques for expression used by abstract games will be applicable to more complex games full of fictional characters, worlds, and stories. Secondly, this line of inquiry opens up new roads for experimentation in game design. As I will discuss at the end of this thesis, very few games have been consciously designed to function as metaphors. Consequently there is a vast, open space to develop design methodology that is not only novel, but produces new types of games.

1. Key Concepts

This chapter introduces several concepts that I will build off of when showing how abstract games can be understood metaphorically. Concepts discussed in this section include general terms such as rules, mechanics, and game. After the brief discussion of these terms I will offer a definition of "abstract game," which is formulated from a semiotic perspective. I then introduce game states, the simulation gap, and unit analysis. I will draw upon these concepts throughout this thesis, as they are essential to applying metaphors to games.

1.1 Defining Basic Terms

Throughout this thesis I will be using the terms "rules," "mechanics," and "fiction." To begin with the latter, fiction refers to the setting or world in which the game takes place (Juul 2005, 121-162), which includes characters; that Mario is an Italian plumber is part of the game's fiction. Isolating fiction as a distinct element of a game is essential, as it will be the focus of my definition of "abstract games."

Following Sicart, I mean "rules" to refer to the properties of a system or space that enable interaction, where "mechanics" are methods whereby an agent modifies the game state (Sicart 2008). In a typical *Mario Bros.* game that levels are timed is a rule, that Mario can jump is a mechanic. A particular type of game mechanic is the "core mechanic," which Salen and Zimmerman define as "the essential play activity players

perform again and again in a game" (316). This may be a single action, or "a compound activity composed of a suite of actions" (ibid.). For example, the core mechanic in *September 12th* is firing a missile, while in *Super Mario Bros.* it is the combination of running and jumping. The distinction between rules and mechanics is important because I will later be discussing unit operations, which in terms of games manifest as mechanics, but not necessarily rules.

I will also make reference to "game objects," by which I mean a significant, isolatable entity that influences or modifies other entities within the game. To return to Mario, he is a game object in that he can influence other objects, such as goombas (by stomping on them) or coins (by collecting them). Mario's moustache is not a game object (in any game to date), nor is the person playing the game; in board games the term refers to the actual pieces being manipulated by the player. Game objects generally fall under Järvinen's category of "components" (2008, 63-66), though the term is intentionally broadly defined to allow for general discussion of the elements that comprise a game. This aspect of the term is important for my definition of "abstract games," which will be discussed later in this chapter.

1.2 Abstract Games

The phrase "abstract game" tends to be used in reference to games that do not appear to be adapted from any type of source system. My use of the term emphasizes that the game objects are visually abstract in that they do not initially seem to represent or

resemble anything else. However, the adjective "abstract" as commonly used is problematic. Intuitively it seems that we should also be able to talk about abstract rules, mechanics,[1] sound, or other elements. If the audio design in *Tetris* featured the Doppler Effect, would we consider the sound more or less abstract than it is now? There are also cases such as *The Marriage*, wherein we find objects that do not look like anything in particular, yet from Humble's website we know that they represent people. These objects are visually abstract, but they represent something concrete.

Given the broad meaning of the term "abstract" a precise definition of "abstract game" is needed. For my purposes here I am interested in games where the game objects do not appear to represent something else; they are visually abstract. For clarity I will be rooting my definition of "abstract game" in semiotics. Semiotics is broadly defined as the study of signs, which includes everything from road signs and letters to drawings and even body language. A sign is anything that stands for, or represents, any other thing, idea, concept, etc. If we consider game objects to be signs, abstract games are those where said objects are not signs on the fictional level, or if they are, operate primarily in the symbolic mode. To explain these concepts in detail I will first present Peirce's model of the sign, followed by sign modalities and semiotic codes. I will then show how the

[1] Juul has discussed abstraction in rules and mechanics at length (2007), however I will not be discussing this aspect of abstraction in games; my emphasis is on visually abstract games.

game objects in Chess, Go, and *The Marriage* function as rule-signs and fiction-signs, arguing that Go and *The Marriage* are abstract games.

Peirce's model of the sign includes three components: the representamen, the interpretant, and the object (Chandler 29), as in Figure 1-1.

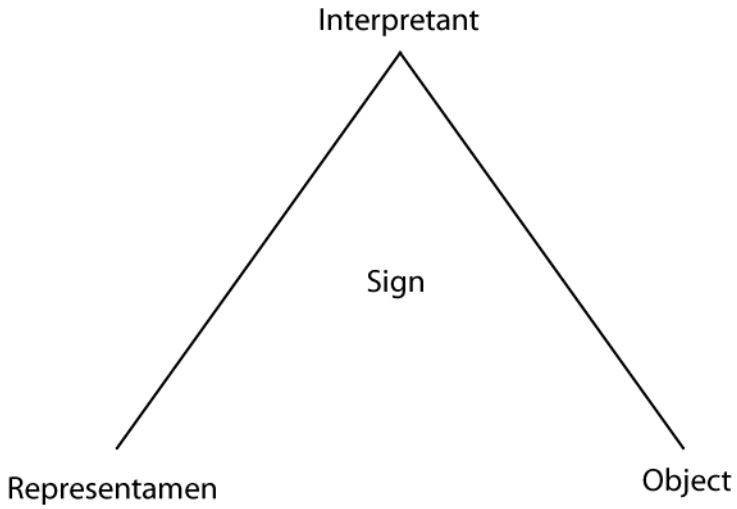

Figure 1-1: Peirce's semiotic triangle

In Peirce's model the "representamen" is the "form the sign takes," while the "interpretant" is "the *sense* made of the sign," and the object is "something beyond the sign to which it refers (a *referent*)" (ibid.). For example, if we consider the word "apple" to be a sign, the representamen is the print on the page that forms the word "apple," the interpretant is what the observer thinks the sign means, and the object is a real apple.

To show how game objects can be Peircean signs we must also consider sign modalities. Peircean signs operate in three different modes: symbolic, iconic, and

indexical. These modes are not mutually exclusive, and any given sign can operate in any combination or number of modes (Chandler 44). In the symbolic mode the representamen does not resemble the object, rather their relationship is "arbitrary or conventional" (Chandler 36). Peirce writes that symbols "have become associated with their meanings by usage" (5). As examples Peirce offers "most words, and phrases, and speeches, and books, and libraries" (ibid.). In the example above, the word "apple" is symbolic, as it has no similarities to an actual apple. In the iconic mode the representamen "is perceived as *resembling* or imitating the [object]" (Chandler 36). Iconic signs "serve to convey ideas of the things they represent simply by imitating them" (Peirce 5). Chandler cites portraits, cartoons, onomatopoeia, or imitative gestures as examples (36-7). In the third mode, indexical, the representamen is "*not arbitrary*, but is *directly connected* in some way (physically or causally) to the [object]." Indexical signs "show something about things, on account of their being physically connected with them" (Peirce 5). Examples include "natural signs" such as smoke, thunder and footprints, as well as measuring devices such as thermometers and clocks" (Chandler 37).

All signs function within codes. Chandler defines codes as "a framework within which signs make sense," noting further that "we cannot grant something the status of a sign if it does not function within a code" (147). For example, we only understand the meaning of a written word if we have access to the relevant code, that is, the language in which the word is written (written words are symbolic; the connection between their form and what they represent is arbitrary). The concept of a code is crucial to semiotics, but for my purposes here it is sufficient to note that when treating game objects as signs the

rules of the game act as one code in which the sign is situated. The following examples assume that the observer understands the relevant codes, which includes the rules of the game as well as cultural codes.

Continuing with the rules-fiction duality, game objects can operate as signs on both levels. For clarity I will use the term "fiction-sign" when considering how the game object operates as a sign in the game's fiction, and "rules-sign" when considering how it operates as a sign in the rules. To demonstrate how this functions, consider a rook taken from a Chess set, such as the one in Figure 1-2.

Figure 1-2: A rook is a sign in terms of game fiction and game rules.

If we consider the rook as a fiction-sign, the representamen is the rook itself, and the object is a castle, or a tower. This sign operates primarily as an icon, as it resembles an actual castle. However, if we consider the rook as a rules-sign its primary modality changes. The representamen is still the rook itself, but the object is the set of rules governing the rook's in-game behavior. Because there is no connection between the form

of the rook and how it behaves – castles do not typically move – the rules-sign is symbolic. Thus it is possible to consider objects as signs on both levels. However, my definition of "abstract game" relies on the modality of the fiction-signs. If we consider the other Chess pieces, we find that most are iconic fiction-signs. The knight typically takes the form of a horse, while the bishop features a clerical hat. The queen and king are both depicted wearing crowns, indicating their royal nature. The pawn is traditionally the least iconic: taken by itself it does not seem to represent anything. However, when we consider the pawn within the rules code, we find that it is appropriately diminutive compared to the other pieces, and the traditional sphere at the top of the piece can be said to resemble a head. In this instance, knowing the code causes the sign to operate more in the iconic mode. Because the pieces are iconic fiction-signs, Chess is not an abstract game.

In contrast, consider the Go stones in Figure 1-3.

Figure 1-3: Go stones during a game.

As with the rook, we can consider these stones as rules-signs. The representamen is the stone itself, and the object is the set of rules governing its behavior. Because there is no connection between the form of the sign and the rules, the rules-sign is symbolic. But if we consider the stones as fiction-signs, it becomes apparent that they are not signs at all: they are simply stones that do not represent anything. Thus Go is an abstract game because its objects do *not* function as fiction-signs.

A third category can be found in Rod Humble's *The Marriage*, shown in Figure 1-4.

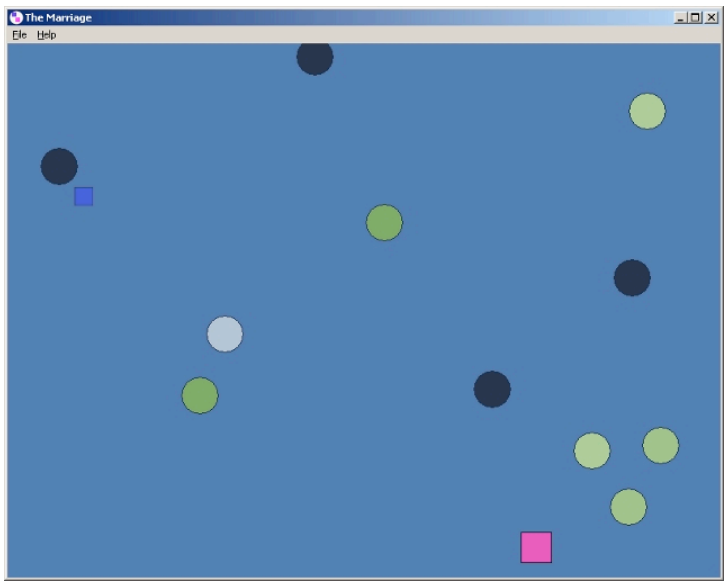

Figure 1-4: Objects in *The Marriage* are symbolic fiction-signs.

As with the other examples, the objects operate as symbolic rules-signs: there is no relation between their form and function. However, these objects do function as fiction-

signs as well. According to the game's designer, Rod Humble, the pink square represents the female in the marriage, and the blue square the male. What differentiates these signs from Chess pieces is that they are *symbolic* fiction-signs: the relationship between their form and what they represent is arbitrary. As such, *The Marriage* is an abstract game.

To sum up: Chess is not an abstract game because the majority of its objects function as *iconic* fiction-signs. *The Marriage* is an abstract game because its objects function as *symbolic* fiction-signs, and Go is also abstract because its objects do *not* function as fiction-signs at all.

I would like to briefly re-iterate my definition's emphasis on the fictional element of games. Under my definition *Tetris* is abstract, as the objects (falling blocks) are not fiction-signs. An easy objection here would be to argue that *Tetris* is not truly abstract because it models gravity, but this objection draws its support from the rules of the game, not the fiction. I am clearly drawing this distinction here because I will later be discussing abstract games that qualify as simulations: their objects do not function as fiction-signs, but their rules are based on a source system. As such my definition stands in contrast to Juul's:

> "An abstract game is a game that does not in its entirety or in its individual pieces represent something else: The game of checkers is a set of pieces that do not mean something else; the game is the rules. There are some conventions around the shape of the pieces and the board, but they do not stand for something else. Tetris is the best-known abstract video game" (2005, 131).

The difference here is slight but significant. For most of the games I will be discussing it is true that the "individual pieces" may not represent something else, but I want to allow for the possibility that the game can or does represent something else via its rules. A key component of this thesis will be my argument that players can read representation into a game's rules via metaphorical projection, even if that representation was not intended by the designer.

Lastly, I would like to address a possible objection to this definition: what about text adventures? Words are clearly symbolic signs: there is no connection between what they look like and what they represent, and so it may seem that text adventures counter-intuitively count as abstract games. However, this objection assumes that the words and phrases in the text adventure are game objects. I would argue that this is not the case: in a text adventure the text mediates the player's interaction with the game objects, which are not represented visually at all.

1.3 Game States

The concept of "game state" is an important element in interpreting games metaphorically. As I will show, the sequence of states in the game directly impacts how the game is interpreted and whether that interpretation makes sense to others.

All games are essentially state machines: "A game is a machine that can be in different states, it responds differently to the same input at different times, it contains

input and output functions and definitions of what state and what input will lead to what following state" (Juul 2005, 60). Järvinen defines game states as "temporal reference points to an event in a game; they represent specific moments in time where the game and its players, and all information concerning them, are in a certain configuration" (2009, 88). Identifying a state requires identifying a precise moment in time. Game states are particularly obvious in turn-based games: "In a Chess game, for example, the game state is represented by the arrangement of the pieces on the board, the captured pieces, and which player is about to move next" (Salen and Zimmerman 218). A complex, real-time video game like *SimCity 2000* is also a sequence of states. States are a defining attribute of all games: "If you cannot influence the game state in any way […] you are not playing a game" (Juul 2005, 60).

While Järvinen includes information about the players, this information is game-specific, including whose turn it is, who is winning, etc. Salen and Zimmerman note that "game state is a *formal* way of understanding the current status of the game, and does not take into account the skills, emotions, and experience of the player" (218).

Game states are relevant to metaphorical interpretation of the system and the affective levels. In terms of the affective level, a sequence of game states can lead to a specific emotional experience, which then correlates to another experience. I will demonstrate how this functions in Chapter 4. In order for the system level to function as a metaphor, the sequence of game states must align with the sequence of states in the

system for which the game serves as a metaphor. This will be discussed in greater detail in Chapter 5.

1.4 Unit Operations

Ian Bogost's critical method of "unit analysis" is a useful method for investigating how game mechanics can be interpreted metaphorically, as it allows us to focus on particular mechanics that are repeated across various games; a unit operation is more specific than a general mechanic. As I will show in "Interpreting the System Level" unit operations can show how metaphorical ideas can be embedded in games from varying cultures, geographies, and time periods. In this section I provide an overview of unit operations and unit analysis.

Unit analysis is "the general practice of criticism through the discovery and exposition of unit operations at work in one or many source texts" (2006, 15), while unit operations are "modes of meaning-making that privilege discrete, disconnected actions over deterministic, progressive systems" (ibid. 3). Unit operations are the individual functions that comprise a larger system; in the case of a game the game mechanics are unit operations. A unit analysis of a game would look for significance or meaning in what the players can and cannot do, not how the system functions or is experienced as a whole. In the case of Chess, this might involve locating meaning in the movement of the pieces, as opposed to the larger patterns of play. Unit analysis does not allow for a

separation between "meaning-making" and discrete actions; the actions themselves create meaning.

As an example Bogost analyzes the 2004 Hollywood film *The Terminal*. Bogost argues that the film's core unit operation is "the 'uncorroborated wait,' a waiting despite any guaranteed resolution" (17). This unit characterizes all of the films characters: each is waiting for something to happen with no end in sight. The focused nature of this unit – the *uncorroborated* wait, as opposed to general waiting – lends it interpretive strength. In this vein, I will show in Chapter 5 that one way to interpret a game metaphorically is by focusing on its unit operations.

1.5 The Simulation Gap

One way that games can be "about something" through their rules and mechanics is through the simulation gap. The simulation gap is relevant to interpreting games metaphorically because, as I will show in Chapter 3, there are important similarities between understanding a game as a simulation and understanding it as a metaphor.

The simulation gap describes the space between the simulation, the source system the simulation is based on, and the user. This gap enables the player to perform a comparative analysis between the game and the system upon which it is based. It also allows the designer to express something about the source system by highlighting or removing certain attributes of the source. The simulation gap is different from

interpretation via metaphor, yet there are important similarities between the two concepts. The core difference is that in the simulation gap the player has already connected the game to something else: the system on which it is based, whereas in metaphorical interpretation the player connects the game to a system or experience that the game was not based on. However, in both instances the game can express ideas or make claims about the other system or experience by highlighting or deemphasizing its various elements. To explain these ideas in-depth I will first present a definition of "simulation" followed by a detailed analysis of how the simulation gap functions. In Chapter 3 I provide a more detailed analysis of the similarities and differences between the simulation gap and metaphor.

To begin with, Gonzalo Frasca defines a simulation as follows: "to simulate is to model a (source) system through a different system which maintains (for somebody) some of the behaviors of the original system" (2003, 223). Using this definition some games are simulations (*The Marriage)* while some are not (*Tetris)*. While I am borrowing Frasca's definition, my use of the term also emphasizes authorial intent. This is an essential clarification, as I will be discussing games that were not based on a source system but can be interpreted as being similar to a system or experience otherwise not intentionally related to the game; as such "source system" refers to a system on which a game is explicitly based, whereas "non-source system" is a system that is only connected to the game by a player's metaphorical interpretation.

Furthermore, I am assuming that the simulation communicates the fact that it is a simulation to the player. This is usually done via the game's fictional elements, but can also occur via paratextual cues such as the game's title, rulebook, help files, or explanatory Web sites. While the word "simulation" tends to evoke complexity, for my purposes authorial intent and communication are far more important. Thus a complex game like *SimCity 2000* is a simulation, but so is the relatively simple *September 12th*: both are based on source systems – a city and the United States Government's militaristic response to the events of September 11th, 2001, respectively. One can imagine a simulation that is abstract and does not inform the user that it is a simulation, and while such simulation would still qualify as a simulation, I will not be taking such examples into account. This is because such a game would be difficult to identify as a simulation and thus could not rely on the simulation gap to shape meaning. Under my definition, then, *Tetris* is not a simulation because it does not communicate a source system.

Simulations enable a specific method of interpretation known as the "simulation gap," which arises through comparison of the simulation and its source system. The simulation gap is the space between a source system, a simulation, and a user. To see how the gap functions, first consider the diagram in Figure 1-5.

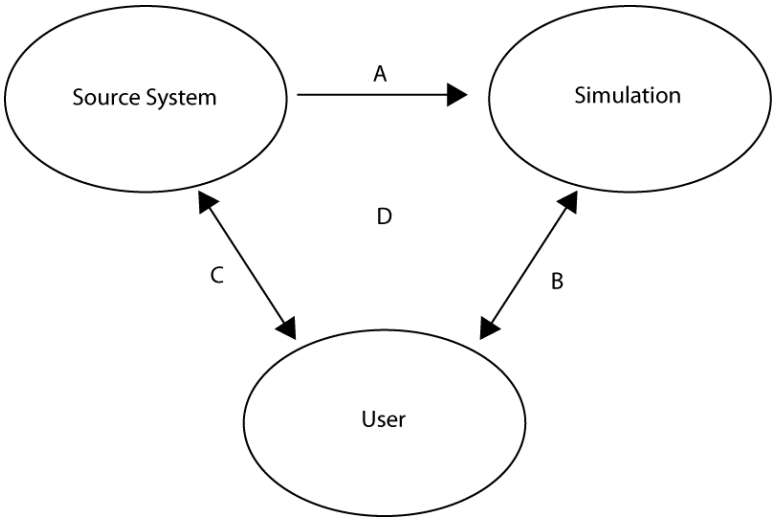

Figure 1-5: The simulation gap is located at point D, between the source system, simulation, and the user.

This diagram models the interplay between the source system, the simulation, and the user. Arrow A represents the abstraction process of creating the simulation based on the source system, which involves selecting which elements of the system to include in the game. Arrow B represents the user's interaction with the system, while arrow C represents the user's interaction and familiarization with the source system. For example, if we are to play a game such as *SimCity 2000*, we are both interacting with the simulation and comparing it to our knowledge of the source system, i.e. a real city. The simulation gap is located at point D, in the space between the three elements of the system. Through interacting with the simulation the player compares the simulation to the source system, focusing on what the simulation has abstracted out and what it has emphasized, which then leads to an interpretation of the simulation.

An example of how this process works can be found in Paul Starr's article *Seductions of Sim; Policy As A Simulation Game.* Starr describes playing *SimCity 2000* with his daughter:

> "But I worried whether the games might not be too seductive. What assumptions were buried in the underlying models? What was their "hidden curriculum"? Did a conservative or a liberal determine the response to changes in tax rates in SimCity? While playing SimCity with my eleven-year-old daughter, I railed against what I thought was a built-in bias of the program against mixed-use development. 'It's just the way the game works,' she said a bit impatiently."

Starr and his daughter both interpret the simulation as having abstracted-out mixed-use development.[2] Starr believes that the simulation is biased against this type of zoning, while for his daughter this absence is inconsequential. The user's own subjective position is a key element in how the simulation gap creates meaning: different people will attach different meanings to what the simulation includes and excludes.

While this specific formulation of the simulation gap is my own, the model has been constructed from Bogost's varying definitions and uses of the term. In Unit Operations he defines a simulation as "the gap between the rule-based representation of a source system and a user's subjectivity" (107) (this subjectivity is manifested in Starr's

[2] Mixed-use development is a zoning technique allowing multiple uses in a single building. A common example is a storefront on the ground level of an apartment building.

opinion of *SimCity 2000*'s omission). This definition is tricky, however. Taken literally, Bogost is providing a definition of *simulation*, not *simulation gap*. Although a phrase of the type "the simulation gap is" does not appear in Unit Operations, we can infer this intention from Persuasive Games: "Previously, I have argued that the ontological position of a videogame (or simulation, or procedural system) resides in the gap between rule-based representation and player subjectivity; I called this space the 'simulation gap'" (43). This passage cites the definition from Unit Operations.

However, upon further investigation it becomes clear that while this is how Bogost defines "simulation gap" this is not how he uses it; much of what Bogost writes about the simulation gap is closer to model in Figure 1-5 than the definition he originally provided. Consider the following excerpt from his analysis of Budweiser's advergame *Tapper*:

> "How does the player experience *Tapper?* By stepping outside of himself and performing the repetitive actions of the bartender, the player is forced to confront the reality of Budweiser's industry: inebriation impairs judgment, which is why it serves as social lubricant. But such impaired faculties also contribute to the sometimes-unintended incremental support of that industry – the drunk get drunker, as it were. *Tapper* defamiliarizes the process of consumption, both through its procedural representation and through the distortion of the bartender the player controls. This defamiliarization opens a simulation gap that invites interrogation of the player's alcohol-consumption practices themselves" (2007, 220).

This analysis assumes that the player is familiar with the source system: a typical bar and its attendant bartender. Furthermore, this familiarity extends beyond the immediate source system to the industry (one of many systems) that enables the bar to function. To help clarify the point we might replace the word "defamiliarizes" in the text with "abstracts." Consumption is a key component of the source system and has been abstracted into the simulation. This abstraction creates a space between the source and the simulation, allowing the user to compare the two. Amongst the three elements – source, simulation, user – we find the simulation gap which enables the user to form an interpretation of the simulation. Another example can be found in Bogost's brief discussion of *Civilization* and *Europa Universalis*. In examining these games' collective historical inaccuracies, Bogost claims that "these contrary-to-fact conditions open a simulation gap for the player to interrogate: the player also learns by meditating on what is *different* in the game's representation of Egypt or Russia compared with the historical (and geographical) record" (2007, 255). These two examples show that while Bogost's definition of the simulation gap as-writ is incomplete, my refinement of the model is based on his examples and is an accurate representation of the overall process.

2. A Tripartite Model of Games

In this thesis I am interested in how players can interpret the various elements of a game metaphorically, and how that interpretation is shaped by the formal elements of a game. To clarify the question it is useful to think of games as consisting of three levels: the audio-visual, the system, and the affective. Each of these elements can be interpreted metaphorically, but I will be focusing on the system and affective levels. Each of these levels is deeply intertwined with the others, which can make isolating them difficult in certain cases. However, separating the levels allows us to talk precisely about how and why metaphorical interpretations work.

It should be noted that this is a model of the various elements a game can *potentially* contain, and is not a model that defines a game's ontological status as a game. For example, "mental Chess" is Chess played without any physical objects: the game takes place entirely in its players' minds. Such a game clearly has no audio-visual level.

2.1 Audio-Visual Level

This level encompasses all of the visual and audio aspects of a game, which includes the game's fictional elements, as well as some non-diegetic and paratextual elements directly connected to the game. Fictional elements include characters, plot and narrative elements, and objects operating as iconic fiction-signs. Non-diegetic elements are components of the game that are situated outside the fictional world, for example the

player's score in *Super Mario Bros.* How these elements are displayed to the player is part of the audio-visual level. Paratextual elements in the audio-visual level include text or art in the game manual or on the box.

Although I will not be addressing this level here, this is not to say that a game's audio-visual design has no impact on how a game can be about something, nor that this level is not subject to metaphorical interpretation. Rather, addressing this level warrants a distinct project of equal or greater scope than this thesis. This is because even simple images can carry an enormous amount of cultural meaning and be very difficult to decode. As Kress and van Leeuwen note, "visual language is not transparent and universally understood, but culturally specific" (3). *The Marriage,* shown again in Figure 2-1, makes a compelling example:

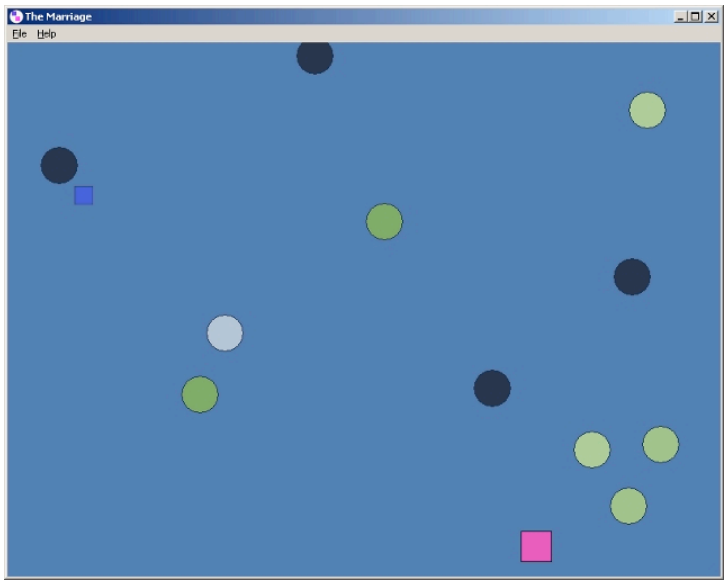

Figure 2-1: In *The Marriage* the blue square (small, upper-left corner) represents the male, and the pink (large, bottom-right corner) the female. The green and white circles are positive influences, the black negative influences.

According to Humble, "The blue and pink squares represent the masculine and feminine of a marriage." This association is firmly embedded in our culture but is by no means universal. Similarly, the black circles represent negative influence: when either square contacts one it shrinks considerably. The association with black and negativity is also cultural. Black also comes into play towards the end of the game: if the player balances the marriage properly for long enough, the background will turn black and the squares will vanish, symbolizing death. The game also leverages cultural associations with size and quantity. Humble informs us that "The size of each square represents the amount of space that person is taking up within the marriage." Functionally a larger square can be said to be "healthier" as well, as it is able to withstand more contact with black circles and other shrinking influences; when a square shrinks to small far it disappears. In the case of these squares, more is better.

The Marriage draws on these cultural meanings and associations to communicate information about the game state to the player. While it is likely that a player who does not have access to this cultural information will still be able to play and understand the game, it will be more difficult to remember what everything represents.

With this short example I have tried to show how even a game whose objects are simple, single-colored geometric objects relies on a wealth of cultural knowledge. Kress and van Leeuwen refer to this type of representation as "social semiotics." While theirs seems to be a potentially fruitful approach to understanding how the audio-visual level functions, such an application is simply beyond the scope of my project here. This is not to say that the audio-visual level is unimportant, or even that it can always be clearly separated from the others. My definition of "abstract game" hinges on the audio-visual level, and it is hard to imagine a simulation communicating that it is a simulation without relying on this level. However, for reasons of scope I will not be addressing metaphorical interpretation of this level.

2.2 System level

The system level includes the rules, mechanics, all of the information needed to play the game, and the space in which it takes place. Other properties that fall under this level include unit operations that occur within the game, goal structures, and game states. Non-diegetic elements may fall under this level as well. For example, the player's score in *Super Mario Bros.* as a numerical value is part of the system level; how that score is communicated to the player is part of the audio-visual level. Metaphorical interpretation of this level will be discussed under "Interpreting The System level."

2.3 Affective Level

The third level, the affective, is about how the game's properties shape the experience of playing it. If we ask how it feels to play a game, or how it makes us feel, the question is concerned with this level. This level is probably the least understood, which is not surprising given how difficult it is to describe. While the gameplay experience is formed by the combination of game and player, I am focusing on how the formal properties of the game contribute to shaping said experience.

Perhaps the best-known analysis of this level is Hunicke, LeBlanc and Zubeck's MDA framework, which stands for Mechanics, Dynamics, Aesthetics. Hunicke et al. define these terms as follows: "Mechanics describes the particular components of the game, at the level of data representation and algorithms." Dynamics "describes the run-time behavior of the mechanics acting on player inputs and each others' outputs over time." Aesthetics essentially refers to what I have labeled the affective level, and "describes the desirable emotional responses evoked in the player, when she interacts with the game system." From the designer's perspective, the game mechanics give rise to the system's dynamics, which leads to "particular aesthetic experiences." The player views this process in the opposite direction: "aesthetics set the tone, which is born out in observable dynamics and eventually, operable mechanics." Within this framework the aesthetic experience is determined by the game mechanics, and as such it is possible to design for certain experiences. Of course the designer can never perfectly predict how a game will make a player feel, but it is possible to stack the odds one way or another.

The term "aesthetic" as it is used by Hunicke et al. is not without its problems. I am referring to this level as the "affective" because one could easily assume that "aesthetic" refers to the game's audio-visual elements. We could say that *The Marriage* has a minimalist aesthetic, while *September 12th* has a cartoon aesthetic, and such statements would likely make sense to most people. For this reason I feel it is important to introduce a new term so as to avoid confusion.

Similar work in describing the affective level (though he does not refer to it as such) has been done by Aki Järvinen, who has written extensively on how player emotions are connected to in-game goals:

> "As we have seen, emotions have to do with planning and goals. So does game play. Games are systems which facilitate 'safe' planning towards goals, and thus they also produce various eliciting conditions for emotions. […] When we are talking about player emotions, we are talking about players' appraisals and actions in relation to goals" (2008, 130).

During a game players experience emotions based on the status of their current goals. Because game goals are part of the game design it is possible to design a game with the intention of eliciting certain emotions (although whether the player finds said emotions enjoyable is another question altogether). As an example Järvinen offers *Missile Command*:

> "the player defends six cities from incoming missiles, and has to make conflicting decisions of which cities to protect and which to leave destined for destruction, as the

> frequency of the missiles increases. The feeling of playing the game is often described as being characterized by panic, as one has to make quick decisions in relation to which component-of-self (a city) to prioritize in protecting, i.e. which parallel goal to abandon and which one to keep on pursuing" (2008, 134).

"Parallel goals" are goals of equal value. In the game each city is equally important, so the goal of protecting one city is just as important as the goal of protecting any other city. In this example a primary emotion felt by players is panic, which results from the fast reactions necessary to play the game combined with the absence of prioritization: everything must be reacted to equally quickly and given equal priority. This panic is part of the game's affective level, which is a result of the game's goal structure, which is in turn an element of the game's system level. In other word, the goal structure (system level) leads to panic (affective level).

As another example, Järvinen also discusses "rumination," an emotional state where players reflect negatively on unattained goals (2008, 136). Rumination is more severe when the unattained goal is of a higher-order than a lower-order. Higher-order goals have a greater degree of importance and often require long-term planning, whereas lower-order goals are of lesser consequence. In Chess, an example of a higher-order goal might be "win the game," while a lower-order goal might be "capture the queen." Furthermore, players can "link" lower-order to higher-order goals. Continuing with the Chess example, if I consider capturing my opponent's queen to be central to winning the game, I have linked the lower-order goal to the higher-order goal. In such a case failing at the lower-order goal is experienced as failing at the higher-order goal (2008, 136-137).

Linked goals increase the probability of a player experiencing rumination. Rumination is thus more likely in games with structured goal hierarchies, as opposed to games with flat goal hierarchies comprised of parallel goals, because in the latter there are fewer opportunities for linking.

Rumination has several implications for game design. Järvinen notes that "the easiest way to cope with this feeling is by engaging into another attempt at beating the game" (2008, 137). A goal structure that encourages linking may also encourage replay of the game by instilling rumination in the player. On the other hand, for some people the negative experience of rumination will encourage them to abandon the particular goal. As such, "games with player defined goals, or a set of alternative goals of the same order, are less likely to produce rumination that makes the player abandon the game" (ibid.).

Rumination illustrates how the affective level is directly connected to the system level. For the player rumination may be part of the emotional experience of playing the game, and as such is part of the game's affective level. Rumination arises from the goal structure, which shows how the experience of playing the game is a direct result of the game's formal properties. A game with structured goal hierarchies, like Chess, encourages linking and thereby increases the odds of rumination. On the other hand, in a game like *Missile Command* where most of the goals are parallel, linking is less likely to occur: a player is unlikely to link saving one particular city with completing the level, unless that city is the only one remaining.

This is of course just a small selection of Järvinen's extensive treatment of player emotions. For my purposes, however, these points are significant in that they further show how the affective level of a game is based on the game's formal structures. The MDA Framework and Järvinen's examples show that when playing games we do not experience emotions arbitrarily, but rather the experience of playing the game is directly related to the formal elements of the game design. The affective level, while distinct from the system level, is nonetheless derived from it. As I will show, metaphorical interpretation of the affective level is not arbitrary but based on the game's formal properties.

3. Metaphors

While each of the three levels described above is subject to metaphorical interpretation, in this thesis I will be focusing on the affective level and the system level. To show how these levels can be interpreted metaphorically I will first introduce several concepts essential to understanding metaphor as a cognitive process. In this chapter I will present a definition of metaphor and metaphorical projection, and show how such projections are made possible by image schemata and experiential gestalts. I will then link these concepts to structural metaphors, experiential metaphors, and orientational metaphors.

3.1 Structural Metaphors and Image Schemata

To begin with, I am using "metaphor" not in the sense of a rhetorical or linguistic flourish, but rather in the cognitive sense as employed by Lakoff and Johnson (1980) and Johnson (1987). Metaphorical projection is the act of applying knowledge or experience from one area of experience to another. Following Lakoff and Johnson, I will refer to the domain that knowledge is taken from as the "source domain" and the domain to which it is applied as the "target domain."

In this section I will be focusing on what Lakoff and Johnson refer to as "structural metaphors." These metaphors are "grounded in systematic correlations within our experience" and enable us "to use one highly structured and clearly delineated

concept to structure another" (61). The emphasis here is on structural similarities between the source and target domains that facilitate our understanding of the target. As an example Lakoff and Johnson offer the RATIONAL ARGUMENT IS WAR[3] metaphor, which as a structural metaphor "allows us to conceptualize what a rational argument is in terms of something that we understand more readily, namely, physical conflict" (ibid.). Lakoff and Johnson show how war and rational argument have structural similarities: both can be won or lost through a series of attacks, counter attacks and defenses. Both involve intimidation, threats, claiming authority, challenging authority, insults, bargaining, and even flattery (63-4). Because of these common elements we are able to connect war and rational argument via metaphorical projection, and this projection directly influences how we conceptualize rational argument.

Metaphorical projection is made possible by what Johnson refers to as "image schemata." These are cognitive structures that organize our experience and comprehension, perhaps best explained through an example. Consider the act of cooking. Cooking is a general set of actions, the specifics of which depend on what exactly is being prepared. A person cooking may be using an oven to bake a cake, a microwave to make soup, or a stovetop to prepare eggs. While "cooking" describes a wide range of possible actions and activities, they are all similar enough to fall under the same general term. Cooking, then, is a high-level image schema, and the general nature of the term is

[3] For clarity's sake, when Lakoff and Johnson refer to a metaphorical concept it is printed in capital letters. I have continued this convention for similar reasons.

important: "cooking" does not automatically mean any one specific thing. A more specific idea, such as baking a cake, is what Johnson calls an "image." Johnson elaborates:

> "A schema consists of a small number of parts and relations, by virtue of which it can structure indefinitely many perceptions, images, and events. In sum, image schemata operate at a level of mental organization that falls between abstract propositional structures, on the one side, and particular concrete images, on the other" (29).

In our cooking example, a relevant abstract propositional structure could be a statement, such as "cooking involves preparing a food item for consumption," whereas the idea of baking a cake is a concrete image.

In Johnson's view, image schemata are a fundamental component of our cognitive processes. He writes:

> "The view I am proposing is this: in order for us to have meaningful, connected experiences that we can comprehend and reason about, there must be a pattern and order to our actions, perceptions, and conceptions. *A schema is a recurrent pattern, shape, and regularity in, or of, these ongoing ordering activities.* […] I conceive of them as *structures for organizing* our experience and comprehension" (29).

Image schemata are inherently flexible and dynamic. Because of this, a given schema can be used to structure numerous similar experiences, thus enabling metaphorical projection from one experience to another. As an example, Johnson offers an analysis of the "from-to" schema. This schema is much simpler than the cooking schema, and thus

can structure many disparate experiences, including cooking. (Johnson is primarily interested in low-level schema and how they are based in our physicality, but for my purposes higher-level schema are significant as well.) This schema consists of three elements: an origin point, a terminal point, and a vector delineating a path from the origin to the terminus. Johnson argues that this schema manifests in numerous events, including: "(a) walking from one place to another, (b) throwing a baseball to your sister, (c) punching your brother, (d) giving your mother a present, (e) the melting of ice into water" (28). Each of these cases involves the "from-to" schema. The last example is metaphorical, as the water does not actually move from one point to another, rather the origin and terminal points are metaphorically projected onto the origin and terminal states. Structural metaphors involve comparing the structured nature of one experiential domain with that of another via an image schema.

Image schemata are significant when interpreting games metaphorically not only because they make metaphorical projection possible, but because they show how such projection relies on structural similarities between the source and target domains. Understanding one domain in terms of another is not an arbitrary cognitive act but relies on the relevant image schemata. Image schemata necessarily shape how formal game elements can be interpreted metaphorically.

3.2 Experiential Gestalts

Gestalts are a key facet of how image schemata and metaphorical projection function. A gestalt is a "complex of properties occurring together [that] is more basic to our experience than their separate occurrence" (Lakoff and Johnson 71). For example, "jumping" is a gestalt in that we conceive of the activity as a whole, not as the constituent parts that comprise a jump (applying force to the ground, losing contact with the ground for a period of time, then falling back down and reconnecting with the ground). Breaking down a gestalt as I just have "will destroy the meaningful unity that makes it the particular gestalt that it is" (Johnson 44). If instead of writing "jump" I listed the various components of jumping it is unlikely anybody would understand what I was trying to convey; we conceive of gestalts as wholes and are generally unconscious of the constituent parts. As such, the whole is a more basic unit to our understanding than the parts.

Johnson argues that image schemata are gestalt structures in that they consist of "parts standing in relations and organized into unified wholes, by means of which our experience manifests discernible order" (xix). We can see that this is the case if we consider the cooking example from above. We could break down the cooking schema into its various elements, such as working with edible substances, combining ingredients, applying heat, and so on. But if a key element is removed – such as using edible substances – the schema no longer structures only cooking, and may include activities such as mixing concrete or soldering a circuit together. As Johnson notes, "any given

schema can, of course, by analyzed and broken down simply because it has parts. But any such reduction will destroy the integrity of the gestalt, that is, will destroy the meaningful unity that makes it the particular gestalt that it is" (44). While all of these activities fall under a broader schema of preparation or combination, we do not classify all of them as cooking.

In this thesis I will be focusing on a particular class of gestalt known as an "experiential gestalt." An experiential gestalt is a collection of elements or attributes that characterize an experience and allow us to comprehend that experience as a structured whole. Lakoff and Johnson elaborate:

> "Understanding a conversation as being an argument involves being able to superimpose the multidimensional structure of part of the concept WAR upon the corresponding structure CONVERSATION. Such multidimensional structures characterize experiential gestalts, which are ways of organizing experiences into structured wholes. In the ARGUMENT IS WAR metaphor, the gestalt for CONVERSATION is structured further by means of correspondences with selected elements of the gestalt for WAR. Thus one activity, talking, is understood in terms of another, physical fighting. Structuring our experience in terms of such multidimensional gestalts is what makes our experience coherent" (81).

Experiential gestalts combined with image schemata are what allow us to understand one experience as being similar to another. Because experiential gestalts are structured wholes, image schemata enable us to identify when two experiences share a gestalt. As I will discuss in the next section, this process is key to interpreting a game's affective level

metaphorically: the gestalt of playing a game may be similar to that of another experience.

Although I will elaborate on these concepts in the following sections, it should be noted here that structural metaphors do not generally involve experiential gestalts. In the ARGUMENT IS WAR metaphor, for example, the war and rational argument gestalts are drastically different, yet we are still able to connect the two concepts via metaphorical projection. As I will discuss in Chapter 5, structural metaphors are key to metaphorical interpretation of the system level.

3.3 Experiential Metaphors

It is possible for the affective level of a game to closely align with another, unrelated experiential gestalt. Doris Rusch has referred to such instances as "experiential metaphors," which refers to "the phenomenon of understanding a gameplay experience as a physical visualization of abstract ideas such as emotional processes or mental states" (2009). An experiential metaphor is a structural metaphor wherein both the source and target domains are similar experiential gestalts; Rusch emphasizes the affective aspect of an experience, rather than its structure alone. As an example she offers a sequence from *God of War II* where the player traverses a chasm via a grappling hook that must be attached to a series of specific points. She relates the experience of playing this section to that of a transition in one's life:

> "By affording the player to enact courage to let go of a safe but unsatisfying status quo in order to move on to a more promising state it evokes associations to a range of similarly structured experiences. The reluctance to let go, the exhilaration of the free fall as a moment ripe with possibilities but without security, the panic that makes one lash back to the starting point, the anguish that comes with the realization that it is too late to go back, to the feeling of triumph and relief when the adventure has come to a successful conclusion - all these elements can also characterize various experiences of transition and change […]"

Rusch is mapping similar experiences from the source domain (life transitions) to the target domain (*God of War II*'s grappling hook sequence). It should be noted that the core mechanic in the *God of War II* sequence enables Rusch's experience: the player must time letting go from one grip point and connecting to the next, risking disaster in between. For Rusch this closely aligns with the transition gestalt, which is also characterized by alternating moments of stability and uncertainty.

Experiential metaphors are thus a key way in which the affective level of a game can be understood as metaphorically. I will analyze how metaphorical projection of an experience onto a game's affective level functions in Chapter 4.

3.4 Orientational Metaphors

Metaphorical projection primarily functions through structural metaphors: two things are connected via their structural similarities. Another type of metaphor discussed

by Lakoff and Johnson is the "orientational metaphor." This category of metaphor is so-named because these metaphors have to do with spatial orientation, such as up-down, in-out, center-periphery, front-back, on-off, and deep-shallow (Lakoff and Johnson 14). Whereas structural metaphors "structure one concept in terms of another," orientational metaphors organize "a whole system of concepts with respect to one another" (ibid.). For example, the metaphor GOOD IS UP systematizes several other metaphors that are more specific, such as HAPPY IS UP, SAD IS DOWN; HAVING CONTROL IS UP, BEING SUBJECT TO CONTROL IS DOWN; MORE IS UP, LESS IS DOWN; and HIGH STATUS IS UP, LOW STATUS IS DOWN (ibid. 15-16). All of these metaphors make intuitive sense because of their relationship to GOOD IS UP.

I will primarily be discussing orientational metaphors with regards to metaphorical interpretations of the system level in Chapter 5.

3.5 Metaphorical Projection and the Simulation Gap

I have so far in this thesis defined simulations as having a source system, meaning some games are simulations and some are not. This definition relies on authorial intent and communication: the designer bases the game on a source system and that basis is made apparent to the player, be it through the game objects or paratext.

Interpreting a game via metaphorical projection and via the simulation gap are two similar yet different cognitive acts. In the case of a simulation, the player is

presumably aware[4] that the game is based on a source system, and begins playing with the simulation gap already in place. The player is then able to contrast the simulation to the source as play progresses. Interpretation via metaphorical projection, however, generally occurs in one of two ways. Such interpretations can be formed through a reflective process that requires a close analysis of the game's affective or system levels. They can also arise spontaneously and intuitively during the play of game. The key difference is when and how the player connects the game to the outside system or experience. In the case of simulation, the player is given a source system before play even begins, while metaphorical projection occurs during and after play.

While experiential metaphors are structural metaphors – and as such based in the game's structure – there is no guarantee a given player will make such an interpretation of a given game. That said, it is still entirely possible that one player's interpretation will be repeated by other players, or at least understood by them. Metaphorical projection is

[4] This point raises the question of whether a simulation that does not communicate that it is a simulation should be considered a simulation. If we answer "yes," the next logical step is to follow Frasca (2001) and assume that simulations do not need a source system at all; from the player's perspective there is no difference between a game without a source system and a game with an unknowable source system. However, taking this position eliminates the distinction between the simulation gap and metaphorical projection as interpretive acts.

not individualistic: it requires structural similarities that can be objectively traced, as Lakoff and Johnson's ARGUMENT IS WAR example shows.

In my discussion of the simulation gap I noted that the player's comparison of the simulation to the source system can lead to a deeper appreciation of both. Although the initial process is different – the player is not given a source system – experiential and structural metaphors allow the player to compare the game to another experience, system or idea in a manner similar to the simulation gap. This is possible because both metaphorical projection and the simulation gap necessarily amplify and diminish various aspects of the system or idea connected to the game. In the case of simulations, the abstraction process involves choosing which elements of the source system to include and which to exclude; in the *SimCity 2000* example the designers excluded mixed-use development in favor of other aspects of urban dynamics. Lakoff and Johnson note that a similar phenomenon occurs when we understand something metaphorically:

> "In allowing us to focus on one aspect of a concept (e.g. the battling aspects of arguing), a metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor. For example, in the midst of a heated argument, when we are intent on attacking our opponent's position and defending our own, we may lose sight of the cooperative aspects of arguing" (10).

Thus, understanding a game as a metaphor for something else is very similar to understanding a game as a simulation. In both instances we are able to find meaning and expression in the differences. To return to Rusch's *God of War II* example, she notes that

failure to swing from one point to the next results in the player's death. While this aspect makes the affective experience more intense, understanding the sequence metaphorically masks the importance of death in the game because it does not correlate to any elements of the transition gestalt.

3.6 Methods for Metaphorically Interpreting Abstract Games

From these concepts of metaphor we can derive a set of methods for the metaphorical interpretation of the affective and system levels. In terms of the affective level, we can determine if an abstract game functions as an experiential metaphor through the following process: we start by isolating the key elements in the game's experiential gestalt, how those elements are tied to a common sequence of states within the game, and the emotions that arise from those states. From there it is possible to identify a similar, more general experiential gestalt. The two gestalts are then linked through metaphorical projection by mapping elements from the general gestalt (the source domain) to the game's gestalt (the target domain). I will show how this process works in greater detail in Chapter 4.

In terms of the system level metaphorical interpretation can function in two different ways. The first considers the system level as a structural metaphor for another system. This is similar to experiential metaphors, however the source and target domains are not experiences but systems and how they function. This method is also similar to the simulation gap, however, the relationship between the game and the system is established

by the player, not the designer. The second approach considers the unit operations within the game as metaphors; I will specifically be showing how they can reflect orientational metaphors. I will provide an example of each method in Chapter 5.

It should be noted that this critical method stands in contrast to the design approach taken by Madsen and Johansson, who have also applied Lakoff and Johnson's concepts of metaphor to games. They key difference is that under my approach the game is understood as the target domain for metaphorical projection. Madsen and Johansson do not seem to think this is possible:

> "[…] a sunset may be mapped by a spectator upon his or her inner life, and thus be a source domain of a metaphor. However, the sunset cannot be said to 'express' anything in itself since the target domain is missing. A computer game has to contain both a target domain and a source domain in order to be a full metaphor and thus fulfilling our notion of being an expressive form" (82).

Madsen and Johansson argue that the game must include both domains in order to function as a metaphor, which seems a strange claim to make: is the game mapped onto itself? As I will show in the following chapters, understanding a game metaphorically means that the game itself is the target domain, and something else is the source domain. This enables the mode of interpretation I discussed above under "Metaphorical Projection and the Simulation Gap."

4. Interpretation of the Affective Level

This chapter demonstrates how the affective level of an abstract game can be interpreted as an experiential metaphor. This allows us to develop a critical interpretation of the game, and can lead to a deeper understanding of both the source domain and the game. In this chapter I will analyze Janet Murray's oft-cited interpretation of *Tetris*, and argue that her interpretation is of the game as an experiential metaphor. I will then analyze *Tipping Point,* a game designed in the Singapore-MIT GAMBIT Game Lab to teach project management skills. I will show how *Tipping Point* operates as an experiential metaphor for managing schoolwork over a semester.

4.1 *Tetris* as Experiential Metaphor

The best-known example of an interpretation of the affective level via metaphorical projection is Janet Murray's interpretation of *Tetris*:

> "This game is a perfect enactment of the overtasked lives of Americans in the 1990s – of the constant bombardment of tasks that demand our attention and that we must somehow fit into our overcrowded schedules and clear off our desks in order to make room for the next onslaught" (144).

For Murray, the source domain is the "overtasked lives of Americans in the 1990s" and the target domain is *Tetris*: she is projecting aspects of the source onto the target, thus forming her interpretation.

Scholars and critics have offered numerous responses to this reading. Markku Eskelinen has referred to it as "horrid," because "instead of studying the actual game Murray tries to interpret its supposed content, or better yet, project her favourite content on it; consequently we don't learn anything of the features that make Tetris a game" (2001). Eskelinen's reaction is interesting because he seems to be confusing intent: he himself says that she is trying to interpret the game, whereas he is interested in the game's formal properties. Clearly their goals are different and one approach does not automatically refute the other.

Ian Bogost has reacted more positively to Murray's interpretation, calling it "endearing" (2006) and claiming that it is "entirely reasonable" in that she "offers something essential: evidence from the work itself" (2009). However, he claims that Murray wants the game to "function only narratively" (2009). While I cannot speak to Murray's intentions, as I have noted above her interpretation of *Tetris* as it stands is metaphorical, not about reading narrative into the game. She is mapping elements from one domain of experience to another, not arguing that the game tells a story or relates specific events.

Bogost has also criticized Murray's interpretation for its lack of precision:

> "Janet Murray's interpretation of the game as a representation of the unfettered demands of global capitalism would become much more comprehensible to the uninitiated player if she explicitly correlated the game's unit operations with the real world characteristics she has in mind. For example, the constant bombardment of tasks is correlated to the

> continuous generation of new blocks, and the need to fit unending work into overcrowded schedules and desks correlates with the completed lines which disappear, but only to give way to another onslaught of work" (2006, 101).

The correlations Bogost seeks through unit operations are the mappings from the source to the target domain. The experience of receiving an endless amount of new tasks is metaphorically projected onto the experience of receiving an endless amount of new blocks, both of which demand attention. By pushing this type of metaphorical analysis further, we can see how effective the interpretation is.

From this example it is clear that Murray's interpretation of *Tetris* is as an experiential metaphor, as Rusch notes. To evaluate Murray's interpretation more closely we must begin by examining which experiences in the source domain map to which game states in the target domain, a task similar to Bogost's correlations between the game's unit operations and the real-world system. As noted, the source domain is the "overtasked lives of Americans in the 1990s" and the target domain is *Tetris*. The source domain as-writ is unfortunately vague, but we can infer that Murray specifically means Americans employed in some manner of white-collar occupation by her references to desks and schedules. The first relevant experience is that of an impending task, which in a white-collar job could be any number of things. In *Tetris* this maps to a game state in which a new falling block has just begun descending (the state of the rest of the game do not affect this particular mapping). In both instances there is emotional tension originating in the uncertainty of the outcome, because the quality of the completed task has lasting effects. In *Tetris* poor block placement will lead to future game states that are

difficult to manage, while in the workplace poor performance will have short- and long-term negative effects; in both instances this leads to anxiety and stress. Finally, the game reaches a state such that a line is cleared, which leads to a brief relief that is soon interrupted by the next block. This sequence of states maps to a sequence of experiences characteristic of the source domain: completing a task brings a brief respite, which is inevitably interrupted by a new assignment, which in turn brings back the previous anxiety.

Murray's reading of *Tetris* is effective in that she has identified how the experiential gestalt of playing the game – the affective structure of the experience that results from the sequence of game states – aligns with the experiential gestalt of white-collar employment. Both gestalts consist primarily of tension, uncertainty of outcome, consequences, and temporary relief. For Murray the affective level of *Tetris* contains a deeper meaning: the game encourages reflection on white-collar employment. It can also be interpreted as expressing frustration with such employment: the inability to "win" at *Tetris* maps to the phrase "dead-end job," meaning an occupation without opportunity to advance.

4.2 *Tipping Point* as Experiential Metaphor

As another example of how one can interpret an abstract game via metaphorical projection I will next discuss *Tipping Point*. *Tipping Point* was originally designed as an

abstract cooperative board game[5] by a team of students working in the Singapore-MIT GAMBIT Game Lab; I served as producer and designer on the team[6]. The game is abstract because its objects function as symbolic-fiction signs. It is a simulation of product development cycles in a corporate environment. The game is an interesting example because it is an abstract simulation, and can be interpreted as an experiential metaphor of balancing work over a school semester.

Tipping Point was originally produced at the request of Nelson Repenning, an associate professor in the MIT Sloan School of Management. The goal was to design a game that could be used to teach the project management principles described in Repenning et al.'s paper *Past The Tipping Point: The Persistence of Firefighting in Product Development*. To briefly summarize: after studying the product development cycles at several companies, the authors noticed a common pattern. As a product neared launch, the company would devote more and more resources to that product, a practice known as "crunch" or "firefighting." This often required employees to work overtime, and it was not uncommon for teams to be proud of their firefighting abilities. However,

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[5] The game was later implemented in Flash, and is currently playable online at <http://gambit.mit.edu/loadgame/tippingpoint_digital.php>. The board game is downloadable at <http://gambit.mit.edu/loadgame/tippingpoint.php>

[6] In terms of this thesis, this analysis is unique in that I participated in the design of the game.

the researchers discovered that firefighting caused resources to be diverted from other projects that were in earlier stages of development. This increased the likelihood that these projects would fall behind schedule, leading to more firefighting, which then negatively impacted other projects, and so on. The "tipping point" refers to the moment when this downward spiral becomes self-sustaining, and the company is firefighting all of the time.

Repenning et al. offer a simple model of product development where some projects are in "concept development" while others are in "product design and testing" (47), and this model served as the basis for the *Tipping Point* game. The concept development phase is "designed to identify the customer's needs, develop the product concept, and select supporting technologies" (ibid.). During the design and testing phase "the concept developed in the previous phase is turned into an actual product" (ibid.). (Repenning et al.'s research is of course much more complex and nuanced, but because simplicity was a design goal many of the finer points were abstracted out for the simulation.) In the game each player is managing one or more projects, which are represented by the colored crosses in Figure 4-1.

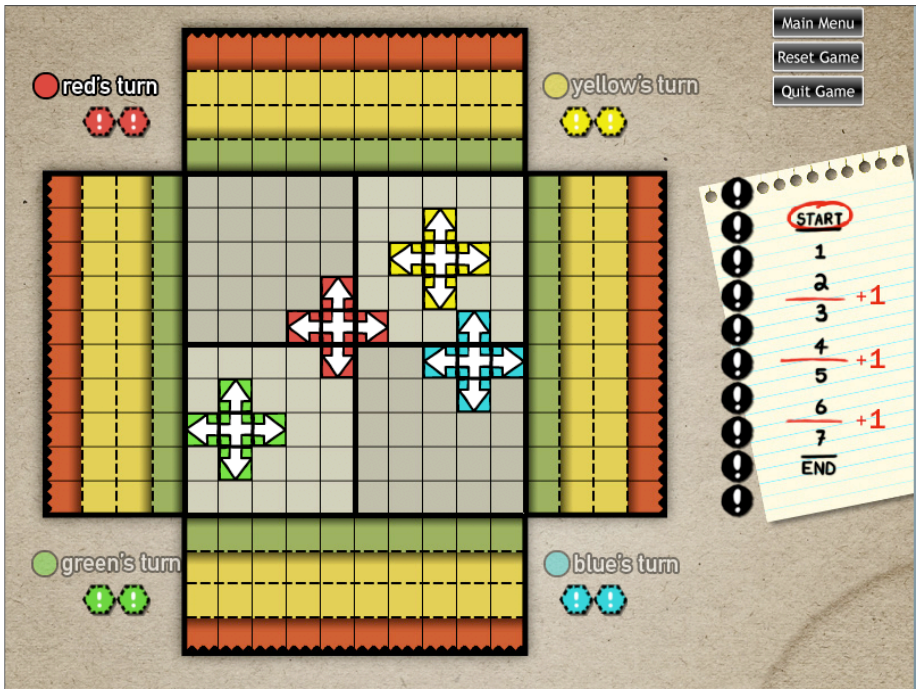

Figure 4-1: *Tipping Point* is played on a grid. The colored crosses with white arrows represent each player's projects. The hexagons with white exclamation marks represent production work, while the black circles with white exclamation marks represent concept work.

After a player's turn, all of his or her projects grow one square in each orthogonal direction. Players must work together to prevent projects from growing onto the red squares at the edge of the board; failure to do so results in a loss for everyone, not just the owner of the project. The players complete projects by strategically placing concept and production work tokens to prevent the projects from growing. On a player's turn he or she may place both of their production tokens, or one of the concept tokens from the communal pool, onto the board. Production tokens only stay on the board for one round,

whereas concept tokens remain indefinitely. The players use these tokens to block projects from growing, and a project that cannot grow is completed. The player whose project it was must then place a new project, and the group earns one point. As a group the players must earn eight points to win, however, after every two points they must take on an additional project. This means that at the start of the game only four projects will be on the board at a time, but at the end there will be seven. The increased number makes the game significantly more difficult, as projects that grow into each other combine to form a single project; these compound projects grow faster and are harder to complete than normal projects.

It must be noted here that the rule governing the increase in the number of simultaneous projects was included as a design decision intended to make the game more interesting. Repenning et al.'s model assumes that the company in question is only ever developing two projects at once.

The simulation thus emphasizes the balance of concept and production work. Production work represents firefighting: while there is a greater short-term benefit than the concept work (because two points may be blocked on a turn instead of one), this benefit disappears on the player's next turn. Concept work's permanence represents how effective planning early in the development process has long-term benefits that last beyond the current project: placing concept tokens always makes the game easier later on, and players will often find themselves in a situation where it is impossible to

complete a project without them. The game makes a strong argument in favor of planning, which was a conscious design goal.

As with *The Marriage, Tipping Point* is an abstract game – the game objects are symbolic fiction-signs - and a simulation. In both instances the player is informed that the game is a simulation via paratextual elements. In the case of *Tipping Point* this includes the rulebook or instruction screen, as well as the introductory web page[7].

While the game design assumes four players, *Tipping Point* is equally playable with less, even one. With respect to the solo version of *Tipping Point,* one possible metaphorical interpretation of the affective level is as an experiential metaphor for managing schoolwork over the course of a semester, be it at the high school, undergraduate, or graduate level. Before elaborating on this interpretation, I want to emphasize that this is *one possible* interpretation. Because this interpretation is rooted in the game's formal properties, it can be objectively traced. But image schemata allow us to connect a wide variety of domains, and it is entirely possible for someone else to form a different metaphorical interpretation that is also objectively traceable. Additionally, as I noted above in Section 3.5, "Metaphorical Projection and the Simulation Gap," metaphorical projection necessarily amplifies and diminishes various aspects of each domain. In the case of *Tipping Point*, understanding the game as an experiential metaphor for a school semester amplifies the planning and coordination aspects of managing coursework, and diminshes the nature of the work done on projects. The

[7] Available at <http://gambit.mit.edu/loadgame/tippingpoint.php>

experience of researching and writing a paper does not map to any element in the game, but scheduling and planning maps very closely to *Tipping Point*'s core mechanic: deciding what type of work to do, when to do it, and where to apply it.

In the solo version the player takes the turn of each of the four colors. In metaphorical terms each color maps to a different class: each has its own assignments that must be completed by different deadlines. In the game, for example, the red project may reach the red zone in four turns, whereas the blue project will reach it in three. While the game's initial state is semi-random (each project begins in a random square of a different quadrant), it is characterized by slight apprehension. In this state the projects are generally far away from their deadlines, but the player is aware that the deadline will grow close very quickly. This state maps to the experience of looking at syllabi during the first week of class. At this point the semester is not particularly stressful, yet the knowledge that the deadlines are already approaching leads to a similar feeling of apprehension.

Over the first few turns of play the state changes significantly: projects begin approaching their deadlines, and the player begins placing various work tokens. Concept tokens create game states where very few projects are blocked, but the short-term disadvantage quickly changes to a long-term advantage as concept tokens assist in finishing multiple projects over time. A state where the board is heavy on concept tokens maps to the experience of having invested time in general academic work, such as improving one's writing or developing one's research interests. In both cases there is a

sense of initial futility, as these efforts have less of a direct impact on completing single projects or assignments, but this frustration is gradually replaced by appreciation as the long-term benefits become apparent: as with concept tokens, this type of work has benefits across several assignments over time. A game state where numerous production tokens have been placed – as opposed to concept tokens – maps to the experience of having spent time on tasks related to a specific assignment, such as formatting or proofreading a paper. These tasks are necessary to complete the assignment but are not particularly useful elsewhere. Such work can be relieving in that it usually means a task is nearing completion, but there this relief is accompanied by the sense that the time could have been better spent on more fruitful pursuits.

In *Tipping Point*, and during a semester, completed projects or assignments are immediately replaced by new assignments. This leads to a state where the new projects are relatively far from their deadlines, which in turn leads to a brief sense of relief: there is now time to place more concept tokens, which will make the game easier later on. Such a state maps to the relief felt after handing in an assignment and having time to focus on more general projects, such as reading or attending to non-school tasks.

Another common game state is when several projects are all approaching the edge of the board simultaneously. This leads to a heightened sense of tension and panic, as each project needs to be carefully managed to ensure that it can be completed. This is an instance of linked goals: the lower-order goal of finishing each project is linked to the higher-order goal of winning the game. In this instance the linked goals amplify the

affective experience, as completing each project in time takes on much greater importance. Such a state requires carefully choosing which project to complete first and what types of work tokens to use, in order to ensure that each project is completed before it reaches the edge of the board. This leads to a sense of apprehension, as any mistake can quickly result in a loss.

This state maps to the experience of having several papers or projects due at the same time: some of these tasks need to be prioritized over others because only so much work can be done on a given project in the remaining time. Being mindful of all the projects creates an experience also characterized by tension and stress, and even panic if the situation proves too difficult. Furthermore, schoolwork also creates linked goals, as completing papers and projects are lower-order goals necessary for the completion of higher-order goals, such as passing the course and eventually graduating. The experience of balancing multiple smaller tasks so that higher-order goals can be achieved is characteristic of both *Tipping Point*'s affective level and the experience of being a student.

While this is similar to the experience of working on product development for a company, the key difference is the ramp-up of work and the associated affective experience. As noted previously, Repenning et al. assume that a given company is producing two products at once with no definite end, whereas *Tipping Point* and a school semester are characterized by the increase in number of simultaneous projects over a set period time. As the game gets closer to the end, the greater number of projects leads to a

greater number of linked goals, and in turn stronger feelings of tension, apprehension and panic. The same is true of a school semester.

Tipping Point ends with a sort of climactic implosion: the final project is often an enormous, threatening mass that is completed all at once, leaving behind a few smaller projects that must be cleaned up but are no real threat. This sequence of states at the end of the game maps to the experience of a week of final exams, especially when several are scheduled on the same day. After the most intimidating final papers or tests are completed, there are often assignments left of lesser concern. At this point the game/semester is much easier, and the remaining tasks seem almost trivial in comparison to the feats just completed.

The mappings I have described allow the affective level of *Tipping Point* to function as an effective experiential metaphor for progressing through a semester, as both have similar experiential gestalts. Interestingly, the rhetorical point of *Tipping Point* as a simulation – that planning and conceptual work is essential for success – also applies to *Tipping Point* as a metaphor: the key to success in dealing with multiple tasks is effective long-term planning. However, I would argue that the game is more effective as an experiential metaphor than a simulation, largely because of the ramp-up in work over time that is followed by the sudden cessation of new projects. As I noted above, this was a design decision intended to make the game more engaging. The sequence of states that results has more in common with a school semester than a product development cycle,

which means that the affective experience of playing is closer to the experiential gestalt of a semester as well.

4.3 Summary

In this section I have shown how the affective level of a game can take on additional meaning by operationg as an experiential metaphor. In this way an abstract game - which at first glance appears little more than an arbitrary rule set – can be expressive and take on a deeper meaning in a fashion similar to the simulation gap. As examples I cited Janet Murray's famous interpretation of *Tetris* as an experiential metaphor for white-collar employment in the United States. I also discussed how *Tipping Point,* a simulation designed to teach project management, is more effective as an experiential metaphor for balancing schoolwork over the course of a semester.

5. Interpretation of the System level

While the system level of a game includes many different elements, here I am focusing on metaphorical interpretations of the game rules and mechanics, specifically. The rules of a game may be examined from two perspectives: as a systematic whole, or as a collection of individual unit operations. In this section I will first show how the rules-as-system may function as a structural metaphor, and then how a particular unit operation, the "dominating jump," operates as an orientational metaphor.

5.1 *Primrose* as Structural Metaphor

Primrose, shown in Figure 5-1, is an abstract puzzle game by Jason Rohrer.

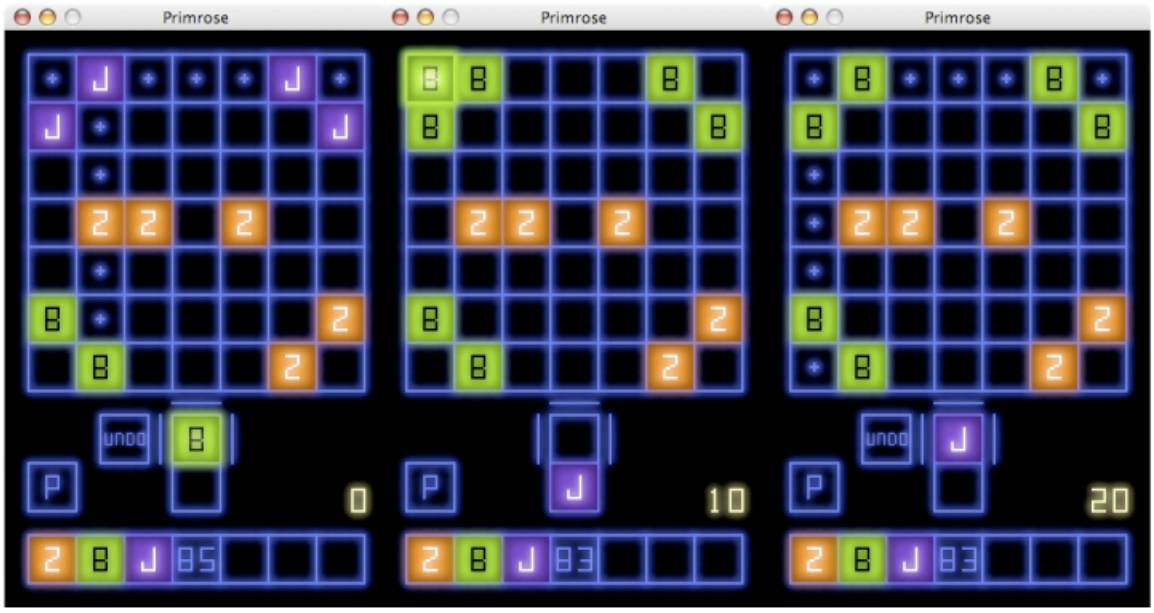

Figure 5-1: (From left to right). First the upper-left corner is empty. A green "B" square is then placed into the empty square. The surrounding purple "J" squares then turn into green "B" squares, and the original green disappears.

At the start of the game the playing grid is empty. Each turn the player is given two colored squares to place in the grid. The first may be placed anywhere, but the second must be placed in the same horizontal or vertical row as the first. If a tile group of one color is surrounded by another color, the first group clears and the second changes color to that of the cleared group. The goal of the game is to earn points by clearing titles; chain reactions are possible and score additional points.

Primrose is clearly not a simulation. The game objects do not function as fiction-signs (there is no fictional element to the game), and there are no paratextual elements that hint at a source system. However, the rules of the game create a sequence of states that I find reminiscent of martyrdom. The first relevant state is when one group of colored squares is completely surrounded by another group of a different color. This state maps to the typically oppressed state of the martyr, who is surrounded by people who hold different ideas and beliefs. In the next state the interior group vanishes while the exterior group takes on the interior's color, which maps to the martyr's death, followed by the spread of their influence. A prototypical example of this is the Roman Empire, where Christ and many early Christians were put to death by the Romans, a

process that arguable accelerated the spread of Christian beliefs; a key characteristic of the martyr is the increased spread and intensity of their influence after execution.

Of course the act of playing *Primrose* feels nothing like being a martyr, and for this reason the game is not an experiential metaphor. Presumably, the experiential gestalt of martyrdom involves conviction, loyalty and suffering. The experiential gestalt of *Primrose* consists of contemplation and planning, as a great deal of time is spent considering the next move. The two gestalts are extremely different, and as such *Primrose* can be interpreted as a structural – but not an experiential - metaphor for martyrdom.

Primrose illustrates another key difference between experiential and structural metaphors: the player's perspective. This is an essential point in Rusch's analysis of *The Marriage*: "Changing the player's perspective (e.g. from one of the partners to the force of love between them) changes what the player does, which changes the experience of the game while not necessarily changing its core argument." *Primrose* is similar to *The Marriage* in that the player of both games is not controlling a "character" directly, but rather influencing the system as a whole. In both games the core mechanic does not map to any element from the source domain, and the player acts as an outside influence on the system as a whole. As a result, these games model (or are metaphors for) how the system works, and not the experience of being a participant in that system.

5.2 The Dominating Jump Unit Operation

It is also possible to interpret an individual rule or mechanic metaphorically. As I noted above, game mechanics are a sub-category of what Bogost has labeled "unit operations," and as such unit analysis is an appropriate method for seeking out metaphors on the system level. The unit operation I am interested in here is the "dominating jump," which is a particular kind of jumping mechanic wherein the jumping object is in a dominant position relative to that which is being jumped over. Things jumped over can be the opposing player's pieces (as in numerous board games), computer-controlled enemies, or the environment in which the game takes place (as in video games). The dominating jump can be a means of attack or avoidance, but dominance is always present. Focusing on this unit operation as opposed to jumping in general allows us to see how this particular kind of jumping manifests across games. Many video games allow the player to jump, but only as a means of navigating the environment, and in those cases the jump is not dominating.

5.3 Games of Leaping Capture

In The Oxford History of Board Games game historian David Parlett uses the phrase "leaping capture" to describe a common mechanic where one game piece jumps over another, thereby "capturing" it and removing it from play. In terms of unit operations, "leaping capture" can be seen as a subcategory of the dominating jump: all leaping capture mechanics are dominating jumps, but not all dominating jumps are

leaping capture. In the following examples when one game object jumps over another to capture it, the jump is a dominating jump.

Of this category Checkers is probably the best-known example ("Draughts" outside the United States). In brief, Checkers is played on the squares of an 8 x 8 grid, the squares alternating in color. Each player begins with twelve tokens[8], which are placed on the dark squares of the first three ranks, and the goal is to eliminate the opponent's tokens. Tokens move one square at a time diagonally, and are captured by jumping one's token over opposing tokens, removing them from play[9]. When exactly the game came into being is uncertain, though Parlett notes that "unambiguous references to Draughts are few and far between prior to 1500, after which it suddenly achieves widespread popularity and analytical attention throughout Europe" (257).

The leaping capture mechanic, however, is significantly older. The earliest game featuring this mechanic mentioned by Parlett is called Alquerque. As with Checkers the game is played between two opponents, each controlling a group of twelve tokens. To begin, the tokens are positioned on "all but the centre point of a 5 x 5 recticular grid" (243), as shown in Figure 5-2.

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[8] All of the board games described in this section use generic tokens for play. As with Go stones these do not function as fiction-signs, and hence the games are abstract.

[9] For a complete history and rule analysis see Parlett, 250-274.

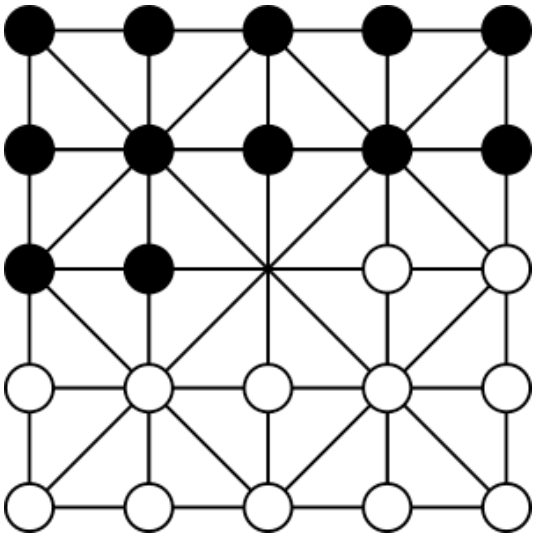

Figure 5-2: An Alquerque board and tokens in starting position. The black and white circles indicate the tokens.

Parlett traces the game to at least 1283 AD (ibid.). As with Checkers, the goal is to remove all of the opponent's tokens. Parlett describes the play as follows:

> "Each in turn moves a piece along a line to the nearest vacant point, the first move being necessarily to the centre. If the nearest line-connected point beyond it in the same direction of travel is vacant, it captures and removes the enemy piece by jumping over it to the further vacancy" (243).

While not as widespread as Checkers was to become, Alquerque nonetheless experienced an impressive geographic spread, reaching Catalonia, Italy, Sicily, Switzerland and Britain; variants have been found in Northern Africa, the Middle East, India, and South-East Asia (ibid. 244-5).

Parlett also describes a handful of games that are similar to Alquerque but whose relation to it is uncertain. *Ko-na-ne* is a native Hawaiian game played on a grid of 100 points or spaces. Black and white tokens are placed onto these spaces in an alternating fashion. Two adjacent tokens – one of each color – are removed, and the players take turns jumping one of their pieces over an opponent's, removing it from the board (ibid. 246). Japanese children play a game called *Tobi-Shogi*, or "Jumping Chess." Played on a 9 x 9 board, each player begins with ten tokens on the first two rows of points. Tokens can only move forward one square at a time, capturing opponents by leaping over them (ibid. 247). *Kolowis Awithlaknannai* is a native Mexican game that is essentially Alquerque on a 7 x 7 grid (ibid.).

Through the dominating jump unit operation these games clearly reflect the GOOD IS UP metaphor. When an object jumps over another it is physically in a higher position, and typically swings the game state in the capturer's favor. The fact that games with leaping capture are so geographically widespread and have endured for so long suggests there is something fundamentally appealing about the dominating jump unit operation. The abstract nature of these games indicates that the appeal is intrinsic to the unit itself, and that as a mechanic it seems intuitively correct to have the jumper be superior. Because GOOD IS UP is a fundamental aspect of our conceptual system, it makes sense to see these games as expressions of that metaphorical understanding.

5.4 Jumping in Video Games

Considering the ubiquity of games of leaping capture, it is hardly surprising that the dominating jump has persisted into video games. One of the earliest video game genres to be established was the "platformer," which some thirty years later remains an economically viable and relevant genre. Platformers typically require the player to navigate a character through a fictional world, with a heavy emphasis on jumping over enemies and environmental hazards, as well as between platforms of varying height. In some platformers jumping is also a means of attack - by jumping on to an enemy the player defeats it – but in both instances the jump is dominating.

The genre was arguably started by *Donkey Kong*, the first game to include a jumping character (Arcade History). Other early platformers include *Moon Patrol* and *Pitfall!* The genre was further popularized by the immensely successful *Super Mario Bros.,* as well as *Sonic the Hedgehog*. New platformers are still being developed, and recent big-budget games such as *LittleBigPlanet* and *New Super Mario Bros. Wii* do not much deviate from the established formula. Furthermore, jumping has expanded beyond platformers, notably into first-person shooters such as the *Quake*, *Half-Life* and *Halo* franchises. In these games jumping can be dominating by giving the player a means to traverse environmental obstacles, or an advantage in combat where jumping makes the player a difficult target.

Of course, none of these games are abstract in the sense that I have been using the term. However, I include this brief overview to emphasize the dominating jump's

continued presence in games. This is significant because modern video games can feature characters that perform nearly any physical action imaginable, yet the emphasis has remained on jumping. This emphasis further supports the idea that jumping is an expression of GOOD IS UP.

5.5 The Significance of Understanding Mechanics as Metaphors

Understanding how game mechanics can carry metaphorical meaning is significant for several reasons. First, a mechanic that reflects a common metaphorical understanding can reinforce the game's theme or message. Mario would not seem so powerful if instead of jumping over enemies and obstacles he was forced to dig under or move around them, for example.

Players also make assumptions about how a game works based on metaphorical understanding. Another key orientation for us is center-peripheral, and the resulting metaphor CENTER IS IMPORTANT. We can see this is in phrases such as "this is of central importance," "you are the center of my attention," and "I saw it in my peripheral vision." Also note that we refer to devices such as monitors, keyboards and mice as "peripherals," because they are of lesser significance than the computer itself. Our emphasis on the center is clearly reflected in games with shooting mechanics, where players are unlikely to think they should shoot the outer ring of a target, or that they should miss entirely.

Lastly, mechanics that implement metaphors can tell us something about the culture in which the game was created. As Lakoff and Johnson note, not all cultures share the same associations with a given orientation (14). As such, games created in different cultures are likely to implement orientational metaphors in different ways, and by studying these games we may learn more about their creators. A prevalence of one metaphor over another may indicate which concept is more fundamental. Furthermore, understanding these differences can aid designers in creating games for differing markets, or at least making games that export to other cultures more effectively.

5.6 Summary

In this chapter I showed how the system level of a game can be interpreted metaphorically. In terms of the game's rules, they can be considered as a systemic whole or a collection of units. As an example of the former I showed how the rules of *Primrose* operate as a structural metaphor for martyrdom. In terms of units, I defined a specific unit operation – the dominating jump – and connected it to the orientational metaphor GOOD IS UP. I then showed how games from different cultures, locations, and places in history manifest this unit operation and consequently GOOD IS UP.

6. Closing Thoughts

In this closing chapter I will first highlight several avenues of potential research that this thesis opens-up. I will then conclude with a few notes on the potential for using metaphors in game design.

6.1 Future Research

Any attempt to break new ground in understanding how a medium works will naturally raise numerous questions. In this section I will suggest potential avenues of inquiry that build off of the ideas I have presented in this thesis and could, I believe, make significant contributions to our overall understanding of games. As such, this section is necessarily speculative in nature.

Inverse *Tetris*

One element of *Tetris* not discussed by Murray is the fact that the blocks descend. This aspect may very well have influenced her interpretation of the game: we frequently speak of being "buried in work" or having our email inboxes "piling up." As blocks stack up in *Tetris* we can see the available space diminishing and the mountain of problems growing. *Tetris* can be seen as the instantiation of MORE IS UP, a spatial metaphor that takes precedence over GOOD IS UP. Lakoff and Johnson elaborate:

> "To explain such conflicts among values (and their metaphors), we must find the different priorities given to these values and metaphors by the subculture that uses them. For instance, MORE IS UP seems always to have the highest priority since it has the clearest physical basis. The priority of MORE IS UP over GOOD IS UP can be seen in examples like 'Inflation is rising' and 'The crime rate is going up.' Assuming that inflation and the crime rate are bad, these sentences mean what they do because MORE IS UP always has top priority" (23).

The sense of growing tension associated with the growing pile of blocks is a core element of the game's affective level. Intuitively it seems that if *Tetris* were inverted such that the blocks rose from the bottom towards to the top of the screen it would create a very different experiential gestalt. The remaining blocks would no longer be forming a pile, but rather crowding the top of the screen like helium balloons in a room. Instead of falling down onto a pile, the bricks would seem to float up, as if trying to escape. Testing this theory by having people play traditional or inverse *Tetris* and then discussing their thoughts on and experiences of the game would certainly be illuminating, and may indicate new game design strategies. Such an experiment would also demonstrate how even minor design decisions can significantly impact the gameplay experience.

The Source and Extent of GOOD IS UP

Another potential avenue of research arises when we consider one of the implications of Lakoff and Johnson's discussion of orientational metaphors. They

frequently cite the origin of GOOD IS UP in our bodily experience. For example, they claim that the physical basis for HAPPY IS UP is "drooping posture typically goes along with sadness and depression, erect posture with a positive emotional state" (15). Similarly, the basis for HAVING CONTROL OR FORCE IS UP is "physical size typically correlates with physical strength, and the victor in a fight is typically on top" (ibid.). Furthermore, Johnson argues that image schemata are also based in our bodily experience. For example, our idea of "balance" is rooted in the act of balancing ourselves, which is "*an activity we learn with our bodies* and not by grasping a set of rules or concepts" (74). We then make use of the balance schema when discussing whether visual art is balanced, the difficulty of balancing our work and personal lives, or arguing in favor of a balanced budget.

Lakoff and Johnson hesitate to say that orientational metaphors are universal, noting that "in some cultures the future is in front of us, whereas in others it is in back" (14). Furthermore, the book relies heavily on linguistic evidence that is taken only from English. However, their emphasis on the bodily basis for orientational metaphors implies potential for these metaphors to exist across numerous cultures. The board games featuring leaping capture I discussed in Chapter 5 come from a wide variety of cultures, geographies and points in history, yet they all reflect GOOD IS UP.

Of course the question of to what extent orientational metaphors and image schemata are universal is not only outside the scope of my project here, but is probably unanswerable in any absolute sense. My point is merely that such considerations should

include cultural artifacts, such as games. If GOOD IS UP is in fact rooted in our bodily experience, and thus applicable in numerous cultures, it would explain why games that implement the dominating jump are so ubiquitous.

Social Semiotics and the Audio-Visual Level

As I noted in Chapter 2, Kress and van Leeuwen's concepts of "social semiotics" and "visual grammar" promise to be fruitful methods for investigating how the audio-visual level functions, particularly with respect to abstract games. Although the objects in abstract games are highly symbolic, these symbols can still carry cultural meaning, as I noted in regards to *The Marriage*. A more systematic study of abstract games that includes phenomena such as Go stones of varying materials and value would offer further insights into how games can communicate and express ideas.

Experimenting with the audio-visual design from a social semiotic perspective may yield interesting results as well. For example, it seems that if both squares in *The Marriage* were pink it would drastically alter how players perceive the game. Varying viewpoints surrounding same-sex marriage would likely cause such an altered version of the game to be read as a more political than personal statement, at least by players in the United States. Another interesting experiment might be using colors for the squares that do not have gendered associations, and asking players about the relationship between the squares.

6.2 Conclusion

At the start of this thesis I posited that any general account of how games can be expressive must be applicable to abstract games. Such an account is of paramount importance to furthering our understanding of games as a medium, and with this in mind I have shown that understanding games as metaphors is both effective and applicable to a wide variety of games. Abstract video games (*Tetris*), abstract board games (*Tipping Point*, Checkers etc.), abstract simulations (*The Marriage, Tipping Point*) and decidedly non-abstract games (*God of War II*) can all take on metaphorical meaning.

My approach in this thesis has necessarily been a critical one: I have looked at how finished games function metaphorically. In theory it should be possible to design games using the same principles. For example, to design a game about any emotional experience the first step is to identify the various emotions and processes that define the experiential gestalt. From there the question becomes how to instill similar emotions in the player through the game's system level, which may include the game mechanics, state, and goals. Of course this is easier in theory than in practice, but once such a game has been designed it is then possible for the game to express ideas about that experience through a process similar to the simulation gap. A game about love might emphasize jealousy by requiring the player to keep his or her love interest in sight at all times, and this would be making a different claim than one that emphasizes selflessness. Because

love includes both of these aspects each game would be drawing upon the same experiential gestalt.

In terms of abstract games, this design methodology implies a path for design research. If an abstract game is designed such that the affective level is an experiential metaphor, and the game provides no clue as to what that metaphor might be, will other players connect the experience as intended? This certainly seems possible, as evidenced by the fact that I am able to not only understand Murray's metaphorical interpretation of *Tetris*, but can objectively identify the elements of the source domain and how she has mapped them onto the target domain. This implies that abstract games consciously designed to function as an experiential metaphor can be understood by a broad audience. In this case, metaphor-based game design offers enormous potential for creating games of all kinds that are meaningful and expressive in a novel way.

The research and design approaches I have briefly outlined here are of paramount importance if we are to fully understand the expressive potential of games as a medium. As I have shown, the formal elements of a game can both be interpreted metaphorically and designed to operate metaphorically. The affective level of a game - the experience of playing it - can be designed to be evocative of other experiences. This evocation can give the player a deeper appreciation for the game, and can potentially express ideas about the outside experience. On the system level, a game may represent an outside system overtly, as in a simulation, or it may be more subtle and operate as a structural metaphor, in the latter case asking the player to come to his or her own conclusions and connect the

systems on his or her own. Metaphors may be even more subtly embedded in a game: the game's unit operations can embody metaphorical ideas, as in the case of jumping and UP IS GOOD. All of these examples represent potential a game can be expressive, even if it is otherwise abstract.

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