Proceduralist Readings: How to find meaning in games with graphical logics

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ABSTRACT
Newsgames and artgames, two genres in which designers wish to communicate messages to players, often deploy procedural representation. Understanding these *proceduralist* games requires special attention to a game's processes as well as how these interact with its theme and aesthetics. In this paper we present a method for proceduralist readings of arcade-like 2D games so that players can determine their range of intended and unintended meanings, critics can assess the strengths and weaknesses of the presented arguments, and so that designers can identify ways to refine their rhetorical strategies.

Through identifying the components of games that can be interpreted and emphasizing where cultural considerations influence interpretations, we present a framework for *meaning derivations* that strive to take the entirety of a game into consideration. As demonstrated by several examples, this framework requires much more explicit and formal arguments for why a game carries a meaning and precisely where each component of one's argument came from.

Categories and Subject Descriptors
K.8.0 [Personal Computing]: General – Games. I.2.4 [Artificial Intelligence]: Knowledge Representation Formalism and Methods – Representations (procedural and rule-based).

General Terms
Design, Theory.

Keywords
Game interpretation, game design, procedural rhetoric.

1. INTRODUCTION
This paper addresses a convergence point between two popular topics of game studies: expression and interpretation. Works in the first, which include discussions of processes, operational logics, and visual and procedural rhetoric, ask how games can be authored to communicate ideas. Works in the second examine how those ideas are received as the sum of an experience or a close reading of a poignant component.

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1.1 Procedural Rhetoric
Bogost argues that the unique meaning-making strategy of games is "procedural rhetoric," the act of making an expression or argument through a game's processes or rules [2]. In this vein, Rod Humble's *The Marriage* has been much discussed since its release in 2007 for being a prime example as a work that has its "primary medium of expression something unique to games" – the rules [6].

Humble wanted to express his ideas and feelings about marriage without relying on story, imagery, sound, etc. Instead, he wanted to convey meaning only through the game's processes. This approach helped to inspire a *proceduralist* movement of game designers who create games where the "expression is found in primarily in the player's experience as it results from interaction with the game's mechanics and dynamics…" [3]. Proceduralist games have had themes ranging from personal expressions like *The Marriage* (artgames) to outlets of editorial opinions (newsgames).

In a paper discussing how proceduralist games make use of metaphor, Doris Rusch explains the possible causes of her inability to understand *The Marriage* without reading the designer's own statement. Rusch points out that procedural expression tends toward an excessively cerebral reliance on systems-level thinking that is often disconnected from the "affective strengths" of the medium. Her solution to this problem, the *experiential metaphor*, proceeds from Lakoff and Johnson's theories of embodied cognition. Rusch defines experiential metaphor as "the phenomenon of understanding a gameplay experience as a physical visualization of abstract ideas such as emotional processes or mental states" [12]. Her preliminary proof of this concept at work is the feeling of transition that comes at the moment when one swings in between two points in a "grappling hook" sequence in *God of War II*. Rusch explains that letting go of one grappling point to move to the next is a moment when the player, through the game's main character Kratos, exhibits courage that maps to the real world experience of taking risks when moving from something safe to a more advantageous position.

Rusch also cites Janet Murray's infamous reading of *Tetris*—the "perfect enactment of the overtasked lives of Americans" [9]—as an example of the experiential metaphor. These kinds of readings are not uncommon. Steven Poole details the rampant consumerism of *Pac-Man* as he gobbles his way through the maze [11]. Yet, even in his detailed semiotic reading of *Pac-Man*, Poole makes a grand leap from the player being able to

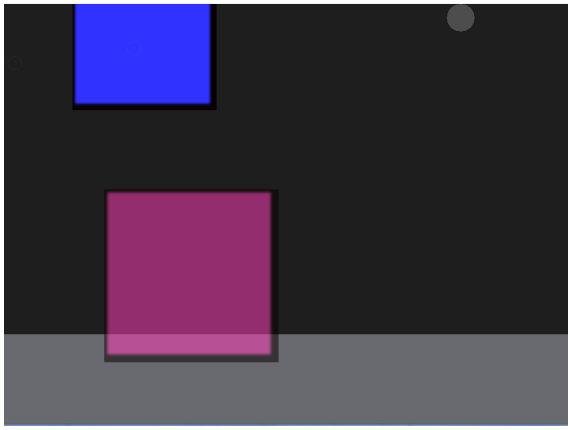

Figure 1. A screenshot from *The Marriage*.

understand how the game works to what it might say as a result. While Pac-Man is indeed consuming many pellets, the other pieces of the game do not have analogous components in the metaphor. How are the pursuant ghosts related to consumerism? What does it mean to get the fruit? Because *Pac-Man* is not obviously about any one thing, it is easy to craft creative allegories as interpretations of the experience of collecting, being chased, and chasing.

While thought provoking and relevant in many ways, the above readings of *God of War II*, *Tetris*, and *Pac-Man*, conflate action, representation and sensation. The interpretations hold only as long as the interpreter omits much of the experience of playing the game and selectively considers only the abstract experience of playing or interpretations of the game's theme.

1.2 Skinning

A common failing of political games, according to Bogost, is that they "apply a political skin to existing procedural mechanics, without attempting to transfer those mechanics into rhetoric supporting a political argument" [2]. Existing games have been politically skinned with differing degrees of success depending on the coupling between the process being addressed and the mechanics of the source game. In *Mayor Munch*, a *Pac-Man* type game about the Toronto mayoral elections, the candidate moves around the maze eating ballots while avoiding other candidates. *Pac-Man* was chosen not because it is appropriate to the situation, but rather because it is familiar to the constituents. The *Gotham Gazette*'s reskinning of *Donkey Kong*, on the other hand, maps well to the electoral process as a sequence of challenges. *Donkey Con (Elephant Invasion)* gives the obstacles and landscape of *Donkey Kong* symbolic meaning in relation to the 2004 New York City mayoral race. Climbing the girders of the familiar game world, the player must avoid the falling barrels that have been reskinned to represent hurdles in the electoral process [1].

The effect is by no means perfect, but a thoughtfully applied skin produces a more meaningful experience by coherently matching a game's mechanics with its content's theme. This topic was explored in previous work where Activision's *Kaboom!* was closely analyzed to reveal what potential meanings its mechanics could carry given different skins, or themes [13]. This paper generalizes and extends the approach of analysis done in that work to be able to apply to all games with graphical logic. The role of a game's skin in meaning making is further elaborated in section 3.2.

1.3 Finding Meaning

Evidenced by the effect of theme on a game's interpretation, meaning in games doesn't come from a single place. Is the meaning of *The Marriage* its reinforcement of gender stereotypes, is it that marriage requires give and take, or is it its historical importance in the game design community? The answer is all of the above and more. Bogost describes this situation by saying "videogames are a mess" [4]. To help sort out the mess, we make the distinction between *internal* readings of a game's dynamics and *external* readings of its context and form. This paper focuses on internal readings.

Video games uniquely combine operational elements (code) and interpretable elements (theme, culture and experience). It is our belief that any claim about a game's internal meaning must take *all* elements into consideration. Despite its creator's attempt to make a purely procedural game, even *The Marriage's* internal meanings rely not only on the rules of the game but also the gender connotations the blue and pink squares. In this paper we present a method for interpreting arcade-like 2D games so that players can determine their range of intended and unintended meanings, critics can assess the strengths and weaknesses of the presented arguments, and so that designers can identify ways to refine their rhetorical strategies. This approach emphasizes the variable meanings a game can hold and advocates for rigorous, comprehensive arguments for these meanings.

After defining the components of internal interpretation, we will present a framework for *meaning derivations*. A meaning derivation is a hierarchical, structured "proof" for what a game means and is the method for a proceduralist reading. The point here is not to say that meaning can be objectively proved, but instead to compensate for the lack of attention to detail in the current state of videogame interpretation. In a meaning derivation, all assumptions of the interpreter are broken into very small units and then logically constructed into rigorous cases for a claimed meaning.

1.4 Scope

Arcade-like 2D games serve as excellent starting points for comprehensive bottom-up and top-down analysis. These games feature graphical logics, a type of operational logic [8] that governs movement, collision detection and physics (i.e. physical interaction) between the visual components on a display. Graphical logics, the interaction between objects on the screen, are well suited to critical analysis because one does not need to turn to the source code of a game to understand how they function. Graphical logics play out right before our eyes. For example, the collision of the ship's projectile with an asteroid in *Asteroids* clearly causes the floating rock to split into two. This is easier to understand than the invisible processes that guide the happiness of the citizens of a *SimCity* town.

Newsgames and artgames are two types of videogame made to communicate ideas, and will be used in the later examples of our approach. This method of discovering derivable meanings, however, is extensible to even the most nonsensical of games. One could validly make a claim about a world in which hot dogs, pickles, and eggs are in competition with hamburgers by applying this method to *Burger Time*. While all games make implicit arguments about the world by encoding ideas as processes, we have focused on games that have explicit communicative intentions.

It should also be noted that a game's audio can be significant to a game's interpretation. However, for the purposes of this paper, all aural components are omitted.

2. THE CODE

To analyze a game using this method of interpretation, we begin by defining the game's components and identifying how they interact with each other. This produces individual units of meaning that possess a set of rhetorical possibilities. The process of determining which of the possibilities has been selected is the subject of the next section.

Code-based components of a meaning derivation should be considered without initial interpretation. While it is useful to refer to an entity by its visual or textual labeling, understanding what it is should have no bearing on what it is doing or how it is interpreted at this stage. The dishonest politician isn't spreading lies that ruin the honest politician's reputation, but he is spawning objects that cause a meter to go down. Thematic considerations, like the dishonest politician and lies, are discussed in section 3.2. The purpose of this separation is to allow all assumptions about a game's theme to made explicit and not be conflated into the descriptions of the mechanics.

This process is different than looking at the source code and describing the game it might produce. By starting with the game instead of the algorithms that comprise it, the player and critic are forced to focus only on that which is being represented. It is also possible that parts of a game's code are necessary for it to function but don't contribute to the core of the argument. Knowing the precise way collisions are handled may or may not have meaning in the sense we are looking for. The interpreter chooses what aspects of the code to consider. However, in order to avoid the pitfalls of the *Pac-Man* and *Tetris* interpretations described above, it is important that as many observable aspects of the mechanics be considered as possible.

2.1 Definitions

2.1.1 Entities

Any element that can be described by a game mechanic, is involved in the dynamics of the system, and can be themed to produce meaning is an entity.

An entity can be singular or plural depending on how it interacts with the rules of the game. Pac-Man, for example, is a singular entity because he is the only of his type displayed on screen. If each of the four ghosts in *Pac-Man* behaved identically they could be considered a plural entity—though there are many, they are functionally one. But because Inky, Pinky, Blinky, and Clyde are each programmed with their own behavioral patterns, a more careful analysis would separate them into four distinct entities. Entities can also exist in arrays, like the projectiles firing from a spaceship.

Topographic elements can also be considered entities if they are involved in the dynamics of the system. The walls in Atari's *Combat* are not only physical barriers that restrict the movement paths of the tanks but, in certain modes, surfaces which reflect projectiles. The interpreter can choose whether or not these entities hold meaning or are merely artificial constructs taken from existing game design patterns.

Similarly, a region of the screen can be an entity if it has some effect on the mechanics. The "neutral zone" in *Yars' Revenge* protects the Yar from the Qotile's missile while preventing the Yar from firing. Also, when the player misses a falling bomb in *Kaboom!* it can potentially be thought of as colliding with a region even though the region is not pictured [13].

2.1.2 Meters

Meters are a special kind of entity which can appear on screen but may also exist behind the scenes. They can keep track of a player's progress or count the number of times an event has occurred. Meters track events in the system and have a descriptive word that precedes their number or graphical representation to note what they are keeping track of. For example, in most games there is a meter for "Score."

A game about bringing food to those in need might have a meter that is incremented or decremented every time the player carries a meal from one side of the screen to a person on the other. While a generic score meter would keep track of the number of times this event occurs, a "Hunger" meter might decrement to illustrate the effect of this good deed. Likewise, a "Happiness meter" might increase on each successfully delivered meal.

Based on the Western spatial metaphors of "good is up, down is bad," increasing score is usually interpreted as positive. Though usually straightforward, this assumption is often ignored. In *Bailout: The Golden Parachute*, the player earns 100 points for each banker that is successfully offloaded onto the backs of the taxpayers. Because this action produces an increase in points it is assumed that burdening the taxpayers is a good thing. If this score were labeled "taxpayer burden," the vivid language would subvert the "up is good" implication (this will be further elaborated in section 4.2).

When meters are not visibly displayed it is up to the player to interpret how they function abstractly. In some cases, it may not be necessary for a player to know that it takes ten collisions to enact a state change, but only that such a change exists.

2.1.3 Goals

The goal of a game can be interpreted in two ways. First, there may exist a goal that represents the completion of a task and the end state of the game. The goal might be to collect all the dollar bills on the screen, to collect all the dollar bills in a certain amount of time, or to collect as many dollar bills as possible before losing all the lives the game has allotted. Completing or failing to complete these goals would then reset the game.

The second type of goal doesn't have an end state but is merely the task the player is supposed to engage in to gain understanding of the system. An example of this is illustrated in section 4.1 by *Molleindustria's Free Culture Game*, which cannot be won or lost. Instead, the goal of the game is to attempt the designated task for as long as it takes to realize the task is overwhelmingly difficult. Choosing to not set an end state is a pointed rhetorical strategy.

2.1.4 Player and Control

It is often appropriate to assume that the player takes the perspective of the entity they control. Given a task, the player controlled entity pursues a goal. They may not agree with playing as the politician stealing votes while dodging the watchdog media, but the game is more likely about the politician's desire to not get caught than it is the media's desire to catch him. This is why *Molleindustria's McDonald's Game* was often interpreted by players as being about the difficulties of running a multi-national

corporation rather than the detrimental practices of a fast food conglomerate [1].

Specifying the method of player control can also be important. A game played with a mouse is different than one controlled with a keyboard or a touchscreen.

2.2 Mechanics

The mechanics, or rules, of the game determine the results of interactions between game entities. A rule may declare something as simple as one entity spawns another or it might declare that the result of a collision between two entities increments a meter.

When noting a mechanic, the player chooses the language that best describes what they perceive as happening. If entity B is always ten pixels from A, the player might describe it as "B stays behind A." Whether B is shadowing A or A is leading B around does not become apparent until the dynamics and theme are taken into account, as is explained in the next section. While the way a computer interprets code is objective, which mechanics are considered or recognized can vary between interpreters. When specifying definitions and mechanics, the interpreter should try to be as true to the code as possible as inaccurate descriptions of the code are provably incorrect.

3. THE INTERPRETED COMPONENTS

While definitions and mechanics are specified in code, meaning is far from it. To make a claim about a game's meaning necessarily involves making generalizations and interpretations about what is observed. These interpretations are based on the individual's worldview and lifetime of experiences. In the context of a meaning derivation, we will refer to subjective influence on the meaning of game as *culture*. For example, the color green is generally understood to be a "happier" color than red within some cultures. When used in an interpretation, these assumptions need to be explicitly stated. For the purposes of analysis, culture could be defined to be the group of people such that the assumptions made will hold true. Viewed in this way, a meaning derivation should hold for at least one "culture."

3.1 Dynamics

The dynamics of a game are "the run-time behavior of the mechanics acting on player inputs and each others' outputs over time" [7]. For example, if a game's goal was to collect money, and there were clay pots which when destroyed released money that the player could collect, a dynamic of this game would be that the player would go around destroying pots. Dynamics describe the emergent behavior of the system.

Dynamics can refer to other dynamics in their definitions. For example, if there was an AI-controlled shop keeper who would yell obscenities when his clay pots were destroyed, because of the dynamic defined above, we could say that the game has an additional dynamic of this game is that the player will tend to make shop keeper yell obscenities.

The emergent nature of videogames makes the list of possible dynamics limitless. Because dynamics exist in a mathematical sense before they are picked out for use in the derivation of meaning, culture is not considered to have a direct influence on their formation.

However, like mechanics, it could be argued that the recognition of which dynamics to observe and utilize in a meaning derivation could be influenced by culture. While this may be true, because differences of opinion with code-related considerations are more often misunderstandings than serious differences of opinion, we do not consider mechanics and dynamics to be directly influenced by culture in the same way theme and aesthetics (described below) are.

3.2 Theme

As noted above, purely abstract mechanics cannot reliably carry meaning. Even the minimalist artgame *The Marriage* relies heavily on the pink and blue colors of the squares to represent gender in order to give its mechanic-based metaphor footing. Theming, which usually involves visual representation or textual explanation, clarifies assumptions being made about a game and shapes the interpretation of mechanics. Because a single mechanic can be interpreted in numerous ways, even the most common sense thematic considerations can explicitly select one interpretation over another.

Theme can also refer to the audio of a game. For example, the sound played upon a collision between two entities' positive or negative connotations could greatly influence a game's interpretation. These connotations are of course influenced by a player's culture.

3.2.1 Rhetorical Affordances

In previous work, the abstract mechanics of Activision's *Kaboom!* were closely analyzed and a theory of meaning through the theming of *Kaboom!* was presented. By simply replacing the images of the Mad Bomber, the bombs and the buckets, the interpretation of the game changed drastically. Starting with the assertion that *Kaboom!* was a game about protecting an unseen world from the attacks of a Mad Bomber, several rounds of re-theming produced other reasonable interpretations for the simple design mechanic of objects dropping from the top of the screen down to the bottom while something in the middle tries to collide with them [13].

That study demonstrated that any set of game mechanics carries with it a set of *rhetorical affordances*. Rhetorical affordances are defined here to be the opportunities for representation made available by the rules that govern the relationship between objects and processes in a system. The meaning that is being selected from a set of possible meanings afforded by a game mechanic is a product of its relationship between other dynamics in the system and the thematic mapping that specifies its domain.

As a simple example, consider two entities, A and B. If B collides with A, B disappears. This mechanic is often used to represent destruction or collection. A reasonable interpretation of this mechanic depends on how A and B are portrayed. For example, if A were to be a human head with its mouth open, and B were to be a hamburger, with some certainty we could say that most would interpret that mechanic/theme combination as representing a man eating a hamburger. But we cannot say that the mechanic itself always represents eating.

If we were to theme A as a chicken and B as a cannonball, we would not likely assume that the cannonball is being removed from the playing field because the chicken is eating it. By nature of its role as a weapon, it is likely that (even in the absence of a game mechanic depicting harm) the cannonball is attacking the chicken. These are just two of the many interpretations that the collision between A and B removing B affords.

3.2.2 Thematic Considerations

In simple arcade-like 2D games like those described in this paper, enumerating a game's mechanics is a relatively straightforward

process. The player and critic might decide the scope or level of detail of their analysis, but a thorough deconstruction should produce largely the same results. Thematic interpretations, on the other hand, introduce culturally influenced interpretation to the formal model.

To fully argue that the simple abstract mechanic of a collision between A and B represents the act of eating requires that B is edible and that A is something that can eat. Likewise, to argue that B is attacking A requires that B is something that is reasonably understood to harm A. But for a creative vegetarian, the collision of the hamburger with the man might be interpreted as an attack. Likewise, a world could exist in which chickens eat cannonballs. But, based on our knowledge and the context of the game, it is much more likely that an explosive volley has been launched at the barnyard fowl. This sort of common sense reasoning applied to theme has been explored in Nelson and Mateas' previous work on automated game theming [10].

Various levels of specificity can be used when detailing thematic considerations in a meaning derivation. For example, it may not be necessary that B is edible or that A is something that can eat for someone to understand a differently themed game with the same mechanics to represent eating, especially when deployed as metaphor. A politician "hungry" for an electoral win may "eat" the money of his campaign donors.

In the process of analyzing a game, thematic considerations are where the interpreter concentrates his or her assumptions that give meaning to the mechanical arguments (described below). Disagreements or points of discussion about an interpretation will often focus around the thematic considerations.

3.3 Aesthetics

The aesthetic considerations of a game sum up how it feels to play. Aesthetic considerations are purely abstract sensations. For example, a game may feel "frantic" or "calm." Aesthetics inform Rusch's experiential metaphor [5] and is also part of the influential MDA framework [7].

Aesthetic judgments may be applied to definitions, rules or dynamics and are also informed by the theme of the game. For example, a game that involved many spiders moving around on the screen while the player has the goal of avoiding them could be described as "scary" by some while if these spiders were re-themed to be flower petals the same set of mechanics could be described as "fun." Furthermore, an individual's notion of aesthetics is informed by his or her culture as it is entirely possible that avoiding spiders would not carry the same connotations in all cultures.

4. MEANING DERIVATIONS

With the above described components, an interpreter can derive meaning in two ways. The first is top-down: meaning *constructed* by starting with an interpretation and identifying how the lower level components make a convincing case for that meaning. The second is bottom-up: meaning *discovered* by identifying the components and considering combinations for rhetorical significance. Each significant combination of components would be one out of a game's practically limitless set of derivable meanings.

As shown in figure 2, the definitions and mechanics of a game combine to form dynamics. Thematic considerations are informed by the player's cultural context and expectations. The aesthetics of the experience are formed by the dynamics, theme and culture of the player. Each interpreted component's origin must be specified in terms of the components that were used in its formation. For example, specific components from the definitions and mechanics categories could combine to form a dynamic and some assumption about culture and a dynamic could form an aesthetic consideration. Next, these interpreted statements combine to form an argument for meaning. Below are two examples that fully demonstrate this process. The first uses meaning derivation to show the rhetorical success of a proceduralist game, while the second demonstrates how meaning derivation can be used to expose missed opportunities for expression.

4.1 Example 1: The Free Culture Game

Game studio *Molleindustria* produced *The Free Culture Game* in 2009 as "playable theory." According to the text accompanying the game, "*The Free Culture Game* is a game about the struggle between free culture and copyright. Create and defend the common knowledge from the vectorial class. Liberate the passive consumers from the domain of the market." The theory, from McKenzie Wark's *A Hacker Manifesto* [14], uses the phrase vectorialist to refer to the owners of data in contrast to the producers, the hackers.

The definitions and goal are explained using text before the game begins, providing us with a point of comparison between the authorial intention and our experience of the game.

To illustrate how the depth of reading can influence interpretation, we will take two passes at *The Free Culture Game*. The first represents the experience of playing the game once for a short

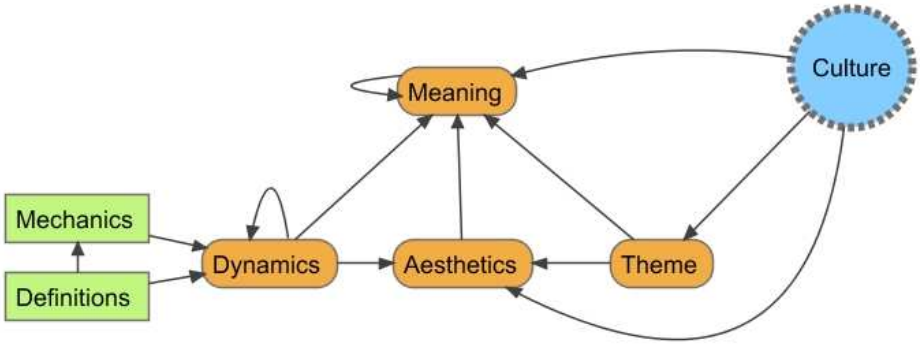

Figure 2. The relationships between the components of a meaning derivation.

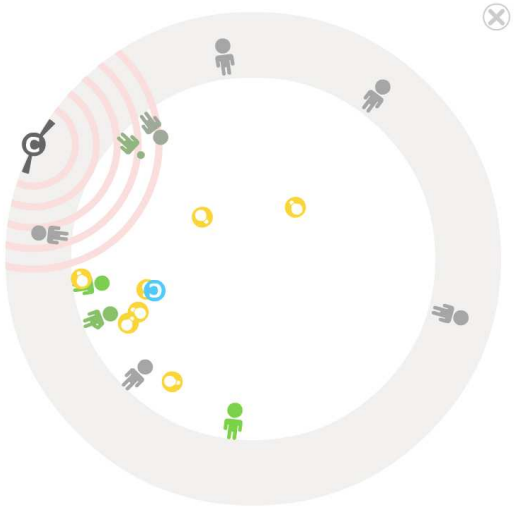

Figure 3. In *The Free Culture Game* the player controls the blue entity (the force of the commons) and pushes the yellow light bulbs (ideas) toward the inward facing people.

amount of time, as one might do when curiously clicking a webpage link referred by a friend. The second is a deeper reading that adds additional definitions and dynamics that would be identified by a critical eye.

We begin by defining the entities, meters, goal, and mechanics. The entities are anything that governed by rules or participate in mechanics. Though we cannot see any meters on screen, playing the game makes it apparent that numbers are being counted behind the scenes and that the green people fade into a duller color over time and eventually convert into the grey people in the grey outer ring. The opening text of the game explicitly states the goal of turning everybody into people in the Commons and that the player is the distributor of knowledge.

Definitions:

Entities:
- Cursor (Blue Circle)
- Producers (Green People)
- Consumers (Grey People)
- New Ideas (Yellow Lightbulbs)
- Vectorialist (Vacuum)

Meter:
- Ideas Absorbed

Goal:
- Turn everybody green

Control:
- Player is blue circle controlled by mouse

Rules and Mechanics:
- Producers spawn new ideas
- New ideas are moved by an indirect force from the blue circle
- Vectorialist moves near group of new ideas
- Vectorialist pulls in new ideas
- Collision between new ideas and the Vectorialist causes new ideas to disappear
- Collision between new ideas and green person increases Ideas Absorbed
- Ideas Absorbed goes down slowly over time
- Producer with empty Ideas Absorbed meter changes to Consumer

Dynamics:
- **dynamic(1)**: Because producers create new ideas, the player's goal is to turn everybody green and the player exerts force on new ideas, *the player will push ideas toward green people to keep them from turning grey*
- **dynamic(2)**: Because the vectorialist pulls in new ideas, a collision between new ideas and the vectorialist causes new ideas to disappear and *the player must get between the vectorialist and new ideas to prevent them from being sucked up*

Themes:
- **theme(1)**: Green people are made to look happier than grey through color and animation
- **theme(2)**: New ideas are desirable objects
- **theme(3)**: Vectorialist visual design is a cold grey and its behavior is automatic, both unfavorable connotations

Aesthetics:
- **aesthetic(1)** → the lack of control over the indirect force that determines how the player's cursors acts on the ideas is frustrating

Meanings:
- dynamic(1) ^ aesthetic(1) ^ theme(1) → **meaning(1)**: New ideas are hard to control but, with careful attention, they will benefit everybody
- dynamic(2) ^ theme(1) ^ theme(3) ^ meaning(1) → **meaning(2)**: the vectorialist is out to steal ideas and does not care about the happiness of people

If a player only spends a couple minutes with *The Free Culture Game*, it is likely that their interpretation is that free ideas need to be protected from ravenous privatization of a force that turns active producers into passive consumers. This process, as it turns out, is quite difficult and needs to be tended to with care or else all producers will be converted to consumers and there will be no more new ideas.

But the system represented by Molleindustria's game does not actually spiral into a single inevitable conclusion. Instead, careful observer will note there are additional dynamics at play which demonstrate the vectorialist's need for new ideas to keep consumers happy. We will briefly define those new components.

Entities: Old Ideas

Meters: Ideas Fed

Mechanics:
- Vectorialist feeds the new ideas it collects as old ideas to Consumers.
- When meter Ideas Fed reaches zero, Consumer changes into Producer
- As Ideas Absorbed meter fills, Producer creates New Ideas more frequently

In the first playthrough it appeared that the vectorialist was taking ideas out of the commons, but the introduction of the Old Ideas element creates a direct relationship between the ideas taken and the ability to keep the Consumers happy. Additionally, when producers are happier they can generate more new ideas.

Dynamics:

dynamic(3): if the vectorialist does not have enough ideas Consumers will move back to the Commons

Figure 4. *Bailout: The Golden Parachute*. The player drops CEOs out of a plane onto the taxpayers below.

Meaning:

dynamic(3) ^ theme(2) ^ dynamic(1) → **meaning(3)**: If more ideas are believed to be better than fewer ideas, then maximizing idea production takes active intervention in the commons. Otherwise, the process is cyclical but stagnant.

Because there is no end state, *The Free Culture Game* will continue indefinitely without player interaction. Unhappy consumers will return to the commons to become producers again and the vectorialist will endlessly pursue those new ideas. It is not a game to be won or lost, but rather a "playable theory" that illustrates how variables in the system are handled.

4.2 Example 2: *Bailout: The Golden Parachute*

Bailout: The Golden Parachute was one of handful of iPhone games created to comment on the government decision to provide loans to major financial companies and the automotive industry in the wake of the post-2008 economic recession. While its visual style does not follow the genre conventions of the traditional political cartoon, it positions itself as a satire in the same vein.

The player drags their finger back and forth across the screen to control the position of a plane flying overhead and, when they spot a car driving across the bottom of the screen they press a button to drop a CEO from the plane onto the car. Successfully landing on the passing auto earns points, while missing it creates a splattering collision with the asphalt. Obstacles—white clouds that slow the fall, dark clouds that electrocute, and tornados that bounce the CEO back up into the air—pass between the plane and cars below.

As a game that labels itself as commenting on the bailout, it carries little actual commentary about the event beyond its charged metaphorical representation. As Bogost observes in *Persuasive Games*, "not all videogames about politics are political" [2]. *Bailout: TGP* refers to a current event without actually addressing it.

Using a more formal first order logic notional scheme as an alternative to the plain English descriptions of *The Free Culture Game*, we will surface level meanings of *Bailout: The Golden Parachute* and suggest ways of changing the game's design to reinforce a stronger rhetorical position.

Definitions:

Entities:
- Plane
- CEOs
- Regular Folk Cars
- White Clouds
- Black Clouds
- Tornado
- Ground
- Golden Parachute

Meters:
- Score
- Lives
- Saved CEOs

Goal:
- maximize(score)

Player:
- controls(player, plane)
- onButtonPress(dropFrom(CEO,Plane))

Mechanics and Rules:
- **mechanic(1)**: drivingLeftToRight(Car)
- **mechanic(2)**: flyingBackAndForth(Plane)
- **mechanic(3)**: dropFrom(CEO,Plane)
- **mechanic(4)**: collision(CEO,Car) → incScoreBy(100 + [#cloudsHit x 100])
- **mechanic(5)**: collision(CEO,Car) → incSavedCEOsBy(1)
- **mechanic(6)**: collision(CEO,Ground) → decLivesBy(1)
- **mechanic(7)**: collision(CEO,White Cloud) → slowFallRate(CEO)
- **mechanic (8)**: collision(CEO,White Cloud) → incScoreBy(#cloudsHit x 200)
- **mechanic(9)**: collision(CEO, Black Cloud) → decLivesBy(1)
- **mechanic(10)**: collision(CEO, Tornado) → bounceUp(CEO) ^ incScoreBy(300)
- **mechanic(11)**: incRoundNumber() → incObstaclesPresent()
- **mechanic(12)**: collision(CEO,Golden Parachute) → incScoreBy(400)
- **mechanic(13)**: ifEquals(Lives,0) → gameOver

Dynamics:
- mechanic(3) ^ mechanic(4) ^ controls(player, plane) ^ goal(maximize(score)) → **dynamic(1)**: Plane wants to drop CEOs onto the passing cars below
- onButtonPress(dropFrom(CEO,Plane)) → **dynamic(2)**: Multiple CEOs can be dropped consecutively
- dynamic(1) ^ mechanic(8) → **dynamic(3)**: the Plane wants to drop CEOs through White Clouds

Themes:
- **theme(1)**: CEOs flail their arms as they fall signifying helplessness
- **theme(2)**: Mattress tied to roof of car implies family has been displaced from their home
- **theme(3)**: Plane is owned by a corporation or government
- **theme(4)**: CEOs have comical elaborate death animations

Aesthetics:
- dynamic(1) ^ theme(1) ^ theme(4) → **aesthetic(1)**: purposely harming CEOs has a satisfying quality

- dynamic(3) ^ mechanic(8) ^ mechanic(11) → **aesthetic(2)**: the increased difficulty when encountering multiple obstacles creates tension, but successfully executing produces a sense of accomplishment

Meanings:

- dynamic(1) ^ theme(2) ^ theme(3) ^ goal → **meaning(1)**: Corporations use displaced Americans to save tumbling CEOs
- meaning(1) ^ aesthetic(1) ^ dynamic(2) → **meaning(2)**: the game is about punishing CEOs.
- goal ^ dynamic(2) ^ dynamic(3) ^ aesthetic(2) → **meaning(3):** risky behavior is rewarded

The above meanings derived from *Bailout: TGP* are the result of the tenuous relationship between the dynamics and theme. It gestures at a range of possible meanings but never takes a stand or represents any specific commentary on the post-2008 economic recession.

The rhetorical affordances of the game's score and obstacles were never utilized. By more tightly coupling the dynamics and theme, a more persuasive argument could have been made. You could imagine a version of the game in which the truly cynical developer labeled the score meter as "Corporate Greed." The mechanics would remain the same and the player could still try to save the CEOs, but in doing so they would realize some sort of consequence. Rather than use clouds and tornados merely because they are found in the sky, the obstacles could have been skinned as impending corporate reform legislation or as United States senators vehemently opposed to the bailout.

Also, despite derived meaning(2), the game misses the opportunity to embrace the argument presented in its iTunes store description. It is not really "the ultimate side-scrolling action adventure for the cynical citizen in all of us," because punishing the CEOs ends the game while saving them earns high scores to be posted on online leaderboards. Furthermore, meaning(2) is not even completely *valid* as it ignores mechanic(9) and mechanic(13).

Another might embrace satire and ignore the game's rhetorical shortcomings. As shown above, *Bailout: The Golden Parachute* can be interpreted to be about how wonderful it is to be a CEO because so long as the taxpayers save you, you can get away with your fiscal irresponsibility. However, for a game that uses a rhetorically charged phrase in its title, there are actually few instances of the golden parachute object in the game.

Through meaning derivations we were able to discover details about how the satire in *Bailout: TGP* functions as well as reveal some weak spots that could leave the player searching for a more scathing critique.

5. CONCLUSION

This approach illustrates how the graphical logics of videogames can be used to create meaning and how the meanings of a game can be extracted through proceduralist readings. Much like the early days of film studies, in which the effects of editing, long take, deep focus, lighting, cinematography, and mise-en-scene were given rhetorical implications, meaning derivations shed light on how the form of videogames functions in representation. Future work will involve closer examinations of particular mechanics and their rhetorical affordances.

The method is currently being used for an in development design assistant tool for journalists to create newsgames: *The Cartoonist*. Enabled by specifying how a game can carry an argument in logical notation, we are developing a rhetorical game generator that reasons about the combinations of mechanics and themes to produce a game carrying a particular meaning.

In this paper we have presented a method for the proceduralist reading of a game through meaning derivations which can be followed by players, critics, and designers to interpret the arguments being made by a game. It is based on the assumption that code-level objects possess rhetorical affordances that give rules and mechanics argumentative power, but that selecting a rhetorical strategy relies heavily on the interplay between a game's dynamics, aesthetic and thematic elements.

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