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UNIVERSITY OF CALIFORNIA
SANTA CRUZ

AN OBJECT-FOCUSED APPROACH TO ANALOG GAME ADAPTATION

A thesis submitted in partial satisfaction of the
requirements for the degree of

MASTER OF SCIENCE

in

COMPUTATIONAL MEDIA

by

Mirek Stolee

September 2020

The Thesis of Mirek Stolee
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Abstract

An Object-Focused Approach to Analog Game Adaptation

by

Mirek Stolee

Since early in the history of digital computing, analog games have been adapted into digital forms. More recently, adaptations are emerging in the spaces between analog and digital games, notably in board games and the genre of escape games. Prior frameworks for understanding analog game adaptation cannot handle these examples. This thesis introduces an object-focused approach: by framing these games as collections of objects, this approach includes games across the analog-digital spectrum based on which objects and rules are made digital, and how. A descriptive analysis of board game adaptations demonstrates that analog game adaptation has three subprocesses: mediation of game objects, digitization of game information, and codification of rules. Applying the approach to escape games expands the concept of mediation and allows for comparison between escape games across media. Escape games also exemplify a new term, "genre adaptation", describing adaptation occurring at the level of genre, not individual works.

Acknowledgments

I want to thank Nathan Altice and Elizabeth Swensen for their timely, thoughtful guidance as we worked through this process together. I would also like to thank the Game Studies, Culture, Play and Practice track at the Southwest Popular/American Culture Association conference for their feedback on early versions of these ideas.

Chapter 1

Board Game Adaptation

The board game *Gloomhaven* (Childres, 2017) is massive in terms of both components and rules. Its box dominates its shelf and weighs over twenty pounds. It contains separate card decks for each of 35 types of enemies, cards and miniatures for several player classes and over 100 cardboard tiles representing the battle arenas for its scenarios. The game's potential playtime is colossal to match. Its cooperative campaign features 95 possible scenarios, each taking two hours or so to play. But these numerous components make it difficult to set up, manage during gameplay, and organize for any future play sessions. The diversity in the scenarios and the challenges they pose for the players makes the rules similarly difficult to manage. Each enemy has individual statistics based on the chosen difficulty of the scenario, and players must manage their health, status effects, and actions in addition to selecting their own moves. Even outside of actually playing the game, coordinating a group of up to four players over the time it takes to finish the campaign is an undertaking in itself.

To play *Gloomhaven* digitally, in contrast, is as simple as launching the software and selecting a mission. In Flaming Fowl's (2019) PC version, the miniature figures and enemy standees come to life in fully-animated 3D models, placed in the correct starting locations automatically. The cardboard tiles representing the game's dungeons are replaced with furnished 3D environments. The components of digital *Gloomhaven* no longer resemble the physical components. Enemy actions are performed automatically, and the tokens used to keep track of their statistics are replaced with standard video game health bars. When the session is finished, the game's components and any progress made in the campaign is stored away in computer memory, ready to be retrieved for next time. While online play is not in the present version of the game, when it is added it will allow players to play through the campaign without physically convening.

Gloomhaven could have been a natively digital game. Its PC version resembles digital turn-based dungeon crawler games more than it does a physical board game. But its board game form has sat at the top-rated spot on board game database BoardGameGeek since late 2017. Its sequel board game, *Frosthaven* (Childres, 2020), raised almost 13 million dollars on crowdfunding site Kickstarter, the most of any board game project on the site to date (Gebhart, 2020). Somewhere in its excess of components and complexity, *Gloomhaven*'s physical form has an appeal to many players. Yet, the game can be played in a number of forms of varying digitality. Besides the fully digital PC version, players might also choose to play with a companion application. Mobile apps like *Gloomhaven Helper* (Esoteric Software, 2018) can help manage the enemy statistics and abilities in game. Other players might play GabrielM's (2018) version of

Gloomhaven on the digital platform *Tabletop Simulator* (Berserk Games, 2015). This version features all of the game's components in a physics sandbox, but without the rules enforcement offered by Asmodee Digital's version.

Gloomhaven Helper and the *Tabletop Simulator* mod lie somewhere between the fully analog and fully digital versions. There are a growing number of these hybrid forms, and not only in board games. The genre of escape games includes not only analog live action escape rooms and digital point-and-click games, but also virtual reality and board game versions that draw from both ends of the spectrum. Current frameworks for understanding adaptations of analog games are not robust enough to include these spaces between purely analog and digital forms, but they provide a foundation for a broader, object-focused approach that can be used for both board games and escape games.

Gloomhaven's existence on digital platforms is not unusual. Board games have existed on computers since early in computing history. As Noah Wardrip-Fruin (2020) suggests, the first video game may even have been a computer adaptation: Christopher Strachey's (1951) version of *Draughts*. Chess also has a rich history of computer versions, as described by Monroe Newborn (1975). Microsoft Solitaire, created by intern Wes Cherry (1988) and bundled with many versions of the Windows operating systems, is one of the most ubiquitous examples. *Gloomhaven* is part of this long history of computer adaptations of board games.

Like a film adaptation of a novel translates the story from a written medium to a visual one, a digital adaptation of a board game translates elements from the physical

game to a computer game. Linda Hutcheon's (2006) work on adaptations helps contextualize this process in relation to other forms of transmedia adaptation. She classifies media into three modes of engagement: telling, showing, and interacting. Hutcheon, coming from the field of literature, centers this analysis around stories. Written texts like novels tell stories, visual media like television and film show them, and computational media like games allow users to interact with them. Adaptations can bridge these modes of engagement, as is the case with a film adaptation of a novel, or within a single mode of engagement, such as a theatre adaptation of a television series. A digital version of a physical board game is an example of the latter, an adaptation between two different approaches to the interactive mode.

In Hutcheon's model, the story is what is being adapted. But while board games certainly can tell stories through their gameplay, for many games that is not the primary focus. Then what is being adapted between versions of the same game? Grabarczyk and Aarseth's (2019) ontological framework proposes an answer. While their main goal is classifying different forms of digital games, their framework includes a category called "game adaptations" for board game adaptations of video games. *Bloodborne: The Card Game* (Lang, 2016), for instance, is adapted from the video game *Bloodborne* (FromSoftware, 2015). Per Grabarczyk and Aarseth, these board game adaptations resemble their digital counterparts in two areas: mechanics and presentation. In *Bloodborne*, players take the role of Hunters who fight monsters and cosmic horrors. Players take this same role in *Bloodborne: The Card Game*, fighting many of the same foes featured in the video game. Like the video game, the board game rewards players

with "blood echoes" when they defeat enemies, and they are still lost when the player's character dies. The board game's presentation also resembles the video game: the typography on the cards and the art for the enemies and equippable weapons appear to be taken directly from *Bloodborne*. But the fluid combat animations of these enemies are not matched by the card game; they are reduced to still images and plastic figurines. So it is not the story, but the presentation and the mechanics that are transferred and changed in the process of game adaptation.

Figure 1.1: Left: A Scourge Beast enemy as it appears in *Bloodborne*. Image from Bloodborne Wiki (2020). Right: The same enemy as a card in *Bloodborne: The Card Game*. Image by FxO (2016).

Jesper Juul (2003), in his transmedia gaming framework, comes to a similar conclusion. Per Juul, the difference between a physical game and its digital adaptation is in its storage of the game state and the way the rules are enforced. Juul positions games as finite state machines that at any moment in time can be in only one state. A difference between analog and digital games is the storage of that game state. For physical board games, the placement and orientation of individual pieces collectively

store the current game state. But this is not true for all tabletop games. Tabletop RPGs in particular have elements of the game state that are stored only in the minds of players. But in many board games, players can read the game state by observing the pieces. A board game's presentation layer consists of all of its individual game components. This makes the board game a multimedia experience; a single game might have hundreds of cards and tokens with unique images and text. The game state, then, is stored by the presentation layer's objects. In a digital game, that same information is stored in computer memory.

This state changes over time according to the rules. Changes in a physical game state are reflected in movements of the pieces. Players cannot change the game state arbitrarily during play; outside of actions available to the player, the pieces cannot be moved. In Juul's framework, the enforcement of these rules is called computation. Players collectively enforce the rules of a physical board game. If one player makes a rules error, like taking a fifth action in a turn, other players correct it. This computation is performed by the human brain rather than by digital computers. The machinery of the game runs on human processing. Computation is the enforcement of the game's mechanical layer.

Although Grabarczyk and Aarseth only explicitly describe the unilateral adaptation from a video game to a board game, the structure of their framework affords reversal. Adapting board games is a two-part process: adapting the presentation and the mechanics. A video game adaptation of a board game often resembles the board game in both mechanics and presentation to an even greater extent than adaptations

in the opposite direction. To transfer the presentation layer is to recreate each of the game's objects for the new medium. For digital adaptations of board games, we can use the term *mediation* to refer to the adaptation of the presentation layer's objects. Mediation refashions the objects for the new medium and in doing so creates a distance between the player and object. In digital versions of board games, this means that the object is represented on a screen and players can only interact with it using an interface like a mouse or touch screen.

When adapting the mechanical layer, there is no need to simplify the board game's mechanics. Designed from the beginning to be run by humans, board games are usually simpler in their mechanics than video games and can be recreated on computers. As Altice (2014) notes, games might even gain mechanical or numerical complexity in the process of adaptation. *Adventure Time: Card Wars'* digital version (Kung Fu Factory, 2014) features vastly inflated card statistics which are simple to calculate for computers but would be frustrating for human players. Board game rules, usually detailed in a rulebook or a manual, can be converted into boolean logic in the game's programming without loss of mechanical detail. We can call this process *codification*.

In both of these frameworks, *Gloomhaven* and its PC adaptation belong on opposite sides of the spectrum of board game media. On one side lies *Gloomhaven* with its physical game state and human-enforced rules, and on the other is *Gloomhaven* on PC, with digitally-mediated components and rules enforced by the computer. They help us understand the relationship between *Gloomhaven*'s purely analog and fully digital forms, but the spaces in between, where the Tabletop Simulator version and *Gloomhaven*

Helper reside, are not yet clear. But many other games belong somewhere in the middle. These frameworks are insufficient for understanding these liminal spaces because they treat both the presentation layer and the mechanical layer as monoliths, not allowing for partial adaptation of either element.

Wardrip-Fruin's operational logics allow us to separate the presentation layer and mechanical layer from one another and to break each into smaller units that can be adapted individually. Operational logics are "combinations of abstract processes and their communicative roles." (p.47) In *Gloomhaven*, the fact that a piece can move from one hex tile to another and cause an adjacent piece to lose resources is an abstract process. When designers assign specific board game components to those mechanics, thereby creating the game's presentation, those processes take on communicative roles. Our character moves toward an enemy figure and deals damage to its life points. Early versions of the war-themed game *Risk* (Lamorisse, 1959) used cubes to represent its soldiers, while more recent versions use plastic human-shaped figures. One can imagine a version that strips away the presentation layer entirely and refers to the soldiers only as abstract cubes. While themes of destruction may still come across in the mechanics, the ways those mechanics are communicated differs because the objects and the ways in which the rules refer to them are changed.

Operational logics are the basic units of game mechanics. They combine to form what Wardrip-Fruin calls "playable models," representations of particular actions. Returning to *Bloodborne*, its operational logics create one playable model of combat. Players press controller buttons to dodge, shoot guns, and swing melee weapons in

real-time through a continuous space. *Bloodborne: The Card Game* adapts the idea of combat, but its combat model replaces real-time action with turn-based card selection and enemy AI with cards detailing the enemy's abilities. Recreating *Bloodborne*'s combat model in a card game would be next to impossible given the number of calculations required. *Bloodborne*'s combat relies on precise collision detection, the real-time management of resources like stamina, and enemy artificial intelligence. Calculations that are nearly instantaneous when performed by digital computation would be much more taxing on the human brain. The digital adaptation of board games originally designed to be processed by humans can copy the playable model in its entirety.

Viewing the previous frameworks in terms of operational logics allows us to develop a new approach to digital board game adaptation. An object-focused approach understands game state and computation as a result of the mediation of specific objects and the codification of rules that govern those objects. Individual objects are either physical or digital, each contributing to the collective game state. Rules pertaining to those objects are either codified or not, giving the computer control over those components and their relevant abstract processes. This perspective allows for not only combinations of mediation without codification and codification without mediation, but also partial mediation and partial codification. We can analyze the adaptation of the presentation and the mechanics separately and observe their impact in terms of Juul's framework.

1 Mediation and the Game State

Pandemic (Asmodee Digital, 2018), an adaptation of the board game *Pandemic* (Leacock, 2008) for Android devices, is a typical example of a digital adaptation. It copies the presentation layer almost entirely from the physical game. *Pandemic*'s Android version uses the same art assets for the cards as the board game, so the sprites of the card faces look exactly the same as the physical cards. But *Pandemic*'s plastic tokens and pawns are replaced with 2D sprites. In Wardrip-Fruin's terms, the direct transfer of abstract mechanics and object representations means the playable models of board game adaptations like Pandemic's are the same as those of their physical counterparts.

Mediation aims to maintain particular affordances of the physical object in its new digital representation. The representations need to convey the same information about the game state as their physical counterpart in order for players to read the game state. Each card in Pandemic has a suit and the name of a specific city on the board, and the Android version displays that same information on its cards. But with digitality comes additional affordances. As digital assets, the representations of the game components can be manipulated by the computer's programming. The computer can move the game's cards and tokens autonomously, allowing the game to be set up automatically. Actions necessary to maintain the game state throughout the game can also be managed by the computer. The computer draws cards for each player at the end of their turns.

Mediation creates one kind of digital game state, in Juul's terms. In *Pandemic*, pawns and tokens are at specific locations on the game board, and cards are placed in front of each player. Players can read the game state by viewing those components. Digitally mediating the game's components moves these pieces into a digital space, but players can still read them as they would the physical game. Digital games like Pandemic on Android store this same information in computer memory. The cards in each player's hand and the locations of tokens are likely reducible to arrays and integers, but that information is presented on screen by digitally mediated components.

Tabletop Simulator is a digital platform on which many different board games can be played. Games on platforms like this one allow us to isolate the impact of mediation from that of codification. Modders can add games to *Tabletop Simulator* by importing media assets like images of card faces or 3D models of game components. The resulting digital objects can be arranged spatially on the game's digital tabletop to recreate the game's human-readable game state. But having the original game's assets present on the computer does not necessarily enable the computer to parse the game state. Games on *Tabletop Simulator*, like johny.quinteros' (2020) *Pandemic Scripted Setup*, a fan-made mod of Pandemic, feature benefits of digital mediation. The digitally mediated cards can be shuffled instantly with one keystroke. The mod's namesake "scripted setup" refers to its ability to set up the game's components automatically by drawing cards from a deck to reveal the initial nine cities that start with infection cubes and then placing those cubes. Mediating objects digitally moves them from a single physical location to a digital space that can be accessed remotely. Any player can host

a Tabletop Simulator server, load up a mod, and have their friends join them at the digital tabletop regardless of geographic distance.

Digital platforms like *Tabletop Simulator* also demonstrate how object mediation affects gameplay. In *Tabletop Simulator*, the game's components are rendered in three dimensions and given physics-based characteristics like mass. This enables games to be played that would not function on other tabletop platforms. This is most obvious in the genre of dexterity games, a type of board game requiring the use of physics. *Jenga* (Scott, 1983) tasks players with removing wooden blocks from a tower without causing the tower to collapse. Games like these rely on the laws of physics to enforce the rules of the game. Tabletop Simulator's physics model and its interface allow particular interactions with the game objects. Objects can be lifted and stacked. Players can "flick" objects to move them, enabling the play of games like *Flick 'em Up!* (Beaujannot Monpertuis, 2015) and *Crokinole* (Wettlaufer, 1876). But as a platform, Tabletop Simulator has its own constraints. Any cards on top of each other will form a deck and the system automatically aligns them in one orientation. Playing a game that stacks cards perpendicularly or in other unusual ways would be difficult on the platform. *Vassal Engine* (Kinney, 2002), another tabletop platform, mediates all components in two dimensions and without physics support. This form of mediation suffices for the wargames *Vassal* was originally designed to support. Vassal began its life as *VASL*, or *Virtual Advanced Squad Leader*. Its original creator envisioned it as a way to connect distant players of the wargame *Advanced Squad Leader* (Greenwood, 1985), as players were difficult to find (Flaibani Kinney, 2010). *Pandemic* can be played on both platforms, but that is

not the case for every game. Both of these platforms mediate objects in a digital space accessible by multiple players, but the games those players can play are determined by the way in which those objects are mediated.

Figure 1.2: Pandemic module (Thestas dalmuti, 2020) on Vassal Engine. Bottom: Pandemic: Scripted Setup on Tabletop Simulator. Screenshots by author.

For all the benefits of digital mediation, it does not afford all the material pleasures of the physical components. Rogerson, Gibbs, and Smith (2016) outline four domains of materiality that board game hobbyists enjoy: players value, customize,

protect, and store game components. Players value their components by fiddling with them. "The pieces of a game have toy-like properties" that allow players to interact with them as objects outside of the rules of the game. Dice are simply fun to stack. The way *Tabletop Simulator* mediates its objects affords toy-like manipulation of the components in a way unmatched by *Vassal*. Players can flick components about, form towers of them, and even send them flying in a fit of rage by flipping the virtual table over. The other domains highlight how materiality is valued even outside of gameplay. Players customize components, either by creating or purchasing "more beautiful or thematically appropriate components" or by enhancing existing components through painting. Some players also find value in protecting the components, a domain that includes placing game cards in plastic pockets, or "sleeving" them, to ensure their longevity. Other players might enjoy storing the components, organizing their game boxes to aid in setup or for aesthetic purposes. Digital mediation removes the need to sleeve and organize components, but also does not offer the opportunity for those who find enjoyment in those processes. *Gloomhaven* on Tabletop Simulator is set up instantly and does not take up any shelf space, but players cannot paint the digital miniatures nor feel the physical cards.

For better or for worse, after these games are set up, control of their components is ceded to the players. There is no action tracking, automation of game steps, or other types of rules enforcement. This is mediation without codification, but it is also representative of a particular type of digital game state. Juul defines a digital game state as one that exists in computer memory. Mediating the game's components does

create a digital game state by this definition, but it is not quite the same as what Juul describes. The game state of these mods are still stored in the positions of objects, only digital ones. This creates a digital game state readable by humans, but not computers. The game-specific information communicated by the positions of objects is not interpretable by the computer. In *Pandemic*, this means no variables are tracking the number of cubes in each city, the locations of player pawns, or the cards in players' hands. What is missing here is the distillation of mechanical information into computer variables that can be referenced in code. We can call that process *digitization*, and it is an important prerequisite for digital computation.

2 Codification, Digitization, and Computation

The mechanics of *Pandemic* on Android are identical to those of the physical version. The challenges posed by the game's rules and the ways in which players can respond are indistinguishable between versions. In *Pandemic*, players can select up to four actions per turn from a list. The Android version presents these available actions at the bottom of the screen as buttons that perform the action when they are tapped. When codified, these rules are no longer optional. Players cannot make their own house rules in *Pandemic*'s Android version nor accidentally cheat the game's systems. One potential benefit is that players do not need to understand the rules comprehensively to play. Physical *Pandemic* is simply a box of assorted objects until a player decides to read the rulebook. As the digital version reacts to their actions automatically, players

can explore the game's mechanics and learn how they operate over time.

But enabling digital computation requires an additional step beyond codifying the rules. *Pandemic* on Android handles the execution of player actions as well as the way the system presents challenges. At the end of each player's turn in Pandemic, several cards are drawn from a deck to determine the location of new disease cubes. To perform that action, the system needs to understand the current game state. Cities in *Pandemic* can hold three disease cubes of a single color. If a fourth is supposed to be added, the city instead experiences an "outbreak" that spawns a cube in every adjacent city. If the computer were unable to read the current game state before the infection phase, it could not handle outbreaks. This is true for automatic processes like the infection phase, and it is also true for handling player actions. Players of the digital adaptation are strictly limited to the four actions allotted by the game's rules, and can only take actions that are legally available to them given the current game state. One action, the "direct flight", allows players to spend a city card to move their pawn directly to that city. As the information about which cards players have is digitized, the system can bar players from taking actions they cannot perform legally. Digital *Pandemic* demonstrates that digitization, in addition to codification, enables the system to enforce the game's rules.

Just as digital mediation can exist without digitization, a computer-readable game state can be created without mediating the game's components. A typical approach is the modification of game components so that their characteristics can be detected by the computer. Mandryk, Maranan, and Inkpen's *False Prophets* (2002) is an example of a research project using this technique. Each component is fitted with an

LED that is detected using phototransistors. The computer uses this location information to dynamically reveal the game's map, projected onto the table, as players move their components to unexplored regions. The digitization of the game's state enables the enforcement of a rule that players can only see particular parts of the game's board based on the location of their pieces.

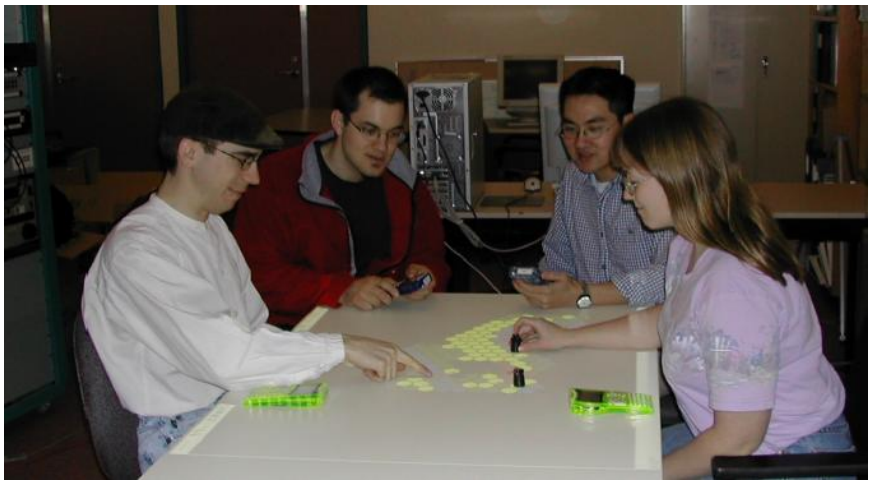

Figure 1.3: False Prophets (2002) tracking the location of game pieces to reveal areas of the game board. Photograph by Diego Maranan (2010).

A more recent example of digitization without mediation is CMON's (2019a) *Teburu* . CMON has an interest in maintaining the materiality of their components. Their former company name, CoolMiniOrNot, alludes to their history of providing many miniature plastic figures in their games. Using embedded electronic sensors in the bases of miniature figures and networked dice, *Teburu* is meant to make the human-readable game state understood by the machine. The results of dice rolls are instantly recognized by the computer, maintaining digitization without digital mediation and without requiring additional player input to the system. The first game set to release on

the Teburu platform is *Zombicide Evolution - Las Vegas* (CMON, 2020), the latest entry in CMON's Zombicide series. The marketing material for Teburu and this first game gives us some insight into how they plan to use their digitized game state. It's *Zombicide*, "but evolved - faster, enhanced, and with a great campaign full of meaningful choices." (CMON, 2019b) The digitized game state can be stored in the computing device, utilized within the game session and stored between sessions of the longer campaign. Game states stored solely in the positions of physical objects are difficult to store for long periods of time.

Figure 1.4: Teburu's integration of electronics with traditional board game components. Screenshot by author.

CMON calls *Teburu* "the future of board gaming," but the digital computation it provides comes at a cost. Social affordances of board gaming can be impacted by digital mediation and computation. Xu et al. (2011) describe board games as a media

that combine physical and social interactions. By examining video recordings of players playing board games, they identify five types of social interaction that occur in board game play, two of which are directly influenced by the materiality of game components: chores, interactions that occur due to action required to upkeep the game state, and the game itself, in which players comment on the game as an artifact. They found that chores like shuffling decks and maneuvering physical objects encouraged players to track what the other players were doing and engage with them. They also found having to enforce rules manually introduced elements of social negotiation which were pleasurable for some players. Mediation, digitization and computation can remove such chores from the experience, a detriment for players who enjoy them.

3 Partial Adaptation

In other games, some components may be digitally mediated while others take physical shape, leading to games that have a dual game state: stored partially in physical components and partially in computer memory. Only some of the game's operational logics are adapted. This approach is most commonly seen in companion mobile applications for physical board games. In the event that the physical components are unnecessary, the game essentially becomes a fully digital game, so publisher Fantasy Flight Games is particularly careful about digitally mediating only some of the game components. *Star Wars: Imperial Assault* (Kemppainen et al. 2014), a dungeon-crawler set in the Star Wars universe, received a companion app called *Legends of the Alliance*

(Fantasy Flight Games, 2017) after its release. In the base game, one player took the role of the Empire, facilitating the enemy side of the game against up to four other players. With the addition of *Legends of the Alliance*, players can play the game fully cooperatively, with added enemy AI.

Legends of the Alliance shows that mediation, digitization, and computation can operate on the level of individual objects. The plastic miniatures that represent player characters and enemies only exist in physical form. They are not digitally mediated nor digitized. Since the app does not know their locations, the enemy AI is limited; the app provides instructions for what the enemy characters do, but it is up to the players to perform those actions on the physical board. Enemy activations provide three possible actions the figure takes in a priority order. The figure can only perform two of the three, and it is up to the players to determine which are possible given the current board state. As the app only has partial knowledge of the game state, it can only provide digital computation based on that partial knowledge. Were the player characters and enemies tracked digitally, though, *Imperial Assault* would become a video game. For *Imperial Assault*, digital mediation and digitization are purposefully limited to preserve the importance of the physical components and allow players to enforce rules pertaining to those components.

Figure 1.5: An enemy activation in Legends of the Alliance. Screenshot by author.

Adapting only some objects and their processes leads to two parallel game states. As the digital and analog components of the game state are meant to make a unified whole, some games in this category aim to keep them in sync using player input. In Fantasy Flights' *The Lord of the Rings: Journeys in Middle Earth* (Hajek Holdinghaus, 2019), players explore a physical board of cardboard tiles which is recreated digitally on the app's screen (Fantasy Flight Games, 2019). This creates a situation where some components are both present physically and digitally mediated. Regions that the players have not visited are marked on the physical map with "exploration tokens," which are removed when the tile is entered. This action serves as a reminder for the players to update the app: when a tile is explored, the player clicks the digital version of the exploration token and the app prompts players to update the physical board with new tiles and tokens that are now visible from their character's new position.

As players do not know what is revealed on each new tile until the app is notified of their exploration, and since the app does not track the locations of the characters and so cannot reveal that information without player input, there is a constant back-and-forth between the two parts of the game state. In *Journeys in Middle-Earth* and *Imperial Assault*, mediation and digitization occur on a component-by-component basis, giving the computer computational authority over only rules concerning the part of the game state it recognizes.

Figure 1.6: Cardboard tiles representing the map in *Lord of the Rings: Journeys in Middle Earth*. Right: The same map, digitally mediated in the *Journeys in Middle Earth* app. Photograph and screenshot by author.

4 Gloomhaven

We can now use this object-focused approach to analyze *Gloomhaven* in its various forms. As a physical game, it feels as if it is fighting against the limitations of its medium. The complex enemy AI requires both intimate knowledge of the rules and the use of many additional components. The existence of so many different digital

versions of the game that make it easier to play points to its inaccessibility. These versions of the game attempt to reduce the complexity of either components or rules through partial mediation, digitization, and codification. An object-focused approach allows us to understand not only the relationship between *Gloomhaven*'s physical form and its PC adaptation, but also the shades in-between.

Gloomhaven is a game ripe for digital adaptation. Many of its elements are designed to capture the benefits of digital gaming in an analog form. Its "legacy" elements combat the transient nature of physical game states. Legacy games are a genre of board games introduced in Rob Daviau's (2011) *Risk: Legacy*. Players of these games make permanent changes to the components by destroying cards or applying stickers when instructed. The placement of pieces as a method of storing the game state is impermanent; it is impractical to leave a game set up and a simple nudge can knock pieces out of their precise positioning. In *Gloomhaven*, players apply stickers to a map of the game's world to indicate locations they have discovered and keep track of the "prosperity" of the region by marking a track on the board. Players can also "enhance" their character class's action cards permanently by applying stickers to them. The persistence of game states from one game session to another is much more common in digital games, as digital data can be stored without taking up additional physical space and without permanently altering game components.

The legacy format is an attempt to capture that progress between sessions using only physical interactions. But there is also a pleasure unique to legacy games in making permanent changes, one that *Gloomhaven* avoids. *Risk: Legacy*'s box is sealed

with a sticker marked "NOTE: What is done can never be undone." *Gloomhaven* does not emphasize the permanence granted by its adoption of the legacy format to this extent. Cephalofair Games, its publisher, even offers removable stickers that can be used with the game to allow the game to be reset to its original form. Players can then play through an entire campaign, carrying their progress across sessions using stickers, and then remove those stickers to reset their progress for replays or passing along to a different group. To achieve a similar flexibility, the PC version of the game simply allows the players to start a new save file. Rather than embracing the analog approach to game state persistence, *Gloomhaven* seeks to replicate the temporary nature of the digital approach.

Gloomhaven also attempts to capture the variety of enemy AI seen in digital games. Players have to manage the status and actions of sometimes more than ten enemy figures in addition to their own characters. Enemies appear in groups of a similar type, such as skeletons, within which each figure has an ID number. This number corresponds to a separate sheet with zones on it for placing damage tokens and status effects for each figure in the group. Enemy actions are determined by drawing from a deck of cards unique to the enemy type, of which there can be five or more of in play concurrently, and then the actions must be performed by players manually for each figure of that type. The tracking of these resources and the carrying out of these actions are rote activities that could be easily handled by a computer. Instead, players manage these actions in addition to their own in-game decisions.

Gloomhaven is not the only game that attempts to capture elements of digital

games in a physical form. Another common example is the inclusion of solo modes. Games like *Pax Pamir* (Wehrle, 2019) and *Wingspan* (Hargrave, 2019) include "AI" players simulated by decks of cards or flowcharts. By following the instructions, players can face automated opponents like they might in a digital version of the game. To make the rules computation manageable for players, many of these opponents do not have all of the same capabilities as human players. *Wingspan*'s "automa" player, for example, does not collect the game's "food" resources nor does it pay any resource costs for its actions. Instead, these players simulate the changes in game state that would occur between each turn taken by the human players. They also provide a score at the end to compete against. For players who want to manage the full complexity of simulated opponents, games in GMT's COIN (counter-insurgency) series like *Cuba Libre* (Grossman Ruhnke, 2013) feature detailed flowcharts that determine which actions the opponent takes. These systems appeal to players who prefer physical components and managing rules on their own, but they, too, invite digital automation. Wingspan Automa Helper (Lascha, 2019), an Android app, helps manage the automa's score for players who want assistance.

To manage *Gloomhaven*'s wealth of both components and rules, some players choose to play versions further toward the digital end of the spectrum. Using apps like *Gloomhaven Helper* in conjunction with the physical pieces hybridizes *Gloomhaven*. This comes with a change in mediation for some of the components. The game state becomes easier to track by removing the need for several of the game's tokens and cards. Enemy health is tracked by pressing plus or minus signs on the app screen,

rather than by adding or removing tokens. The deck of cards for each enemy group is mediated digitally and is shuffled and drawn from automatically, removing the need for the physical decks. The enemy action cards for each group are also ordered by initiative so the players can easily see the order in which enemies act. The operational logics governing enemy mechanics are adapted. By mediating the relevant components and codifying the rules for enemy resource tracking and action determination, *Gloomhaven Helper* reduces both the number of components required and the need to manage those rules. But as the app has no knowledge of the game state beyond these components, enemy turns and all other mechanics must be completed manually using the figures on the board.

The version of the game on *Tabletop Simulator* goes a step further by digitally mediating all of the game's components. All of the game's pieces are translated into digital cards and figures that exist in *Tabletop Simulator*'s physics sandbox. With the click of a button, players can set up each of the game's scenarios. Enemy health is tracked on the figure itself using a health bar, removing the need to cross-reference the figures with their health information that is present even when using *Gloomhaven Helper*. The initiative tracking used in *Gloomhaven Helper* for the enemies is expanded to include the initiative of the player characters as well. This is possible because each player card, which determines the initiative of that player, is tagged with its initiative value. The possible player actions are digitized in this version, unlike in *Gloomhaven Helper* But still other rules of the game are left to the players to enforce. Players move their pieces around the board manually and execute the actions of the enemies

without computational assistance. Players can make mistakes when moving their figure or misunderstand the effect of obstacles and terrain without being notified nor restricted by the game.

Figure 1.7: Top: A player plays the card "Provoking Roar" in Gloomhaven on Tabletop Simulator. Bottom: The same situation in Gloomhaven's standalone digital version. Screenshots by author.

At the far end of the digital spectrum, we find *Gloomhaven*'s PC version. The mechanics of the game are still largely identical. Within a scenario, the changes

to the presentation layer are evident. The plastic miniatures of the base game are now fully animated 3D models. This change goes beyond simple mediation of the components, turning static objects into living characters. While character portraits are ripped directly from the art assets of the physical game, *Gloomhaven* on PC appears very different. Even the cards that players use to select their actions hardly resemble physical cards. Cards in the physical game display two possible actions that players can select. Those two options in the digital game become two separate buttons that the player can click. All of the rules are completely managed in this version, with the game not allowing players to move their pieces in ways counter to the rules and handling the enemy turns automatically.

Ultimately, the ideal stopping point on the spectrum will depend on the player. Each position on the spectrum offers different conveniences and pleasures. To revel in physical excess is simply not possible in the digital space of the *Tabletop Simulator* version, but online play using *Gloomhaven Helper* would require a sophisticated audio-video setup. In its full release, will *Gloomhaven*'s PC version become its definitive form? For players who seek to streamline the experience, this is possible. The existence of so many options implies that many players find the base game difficult to play. Mobile app stores and platforms like *Tabletop Simulator* have opened the doors to fans who want to add digital elements to their games. While *Gloomhaven Helper* is officially licensed, many other companion apps for the game are fan-created. The versions on *Tabletop Simulator* are similarly created by fan modders. Players not only choose to play adaptations, but perform the process of adaptation themselves. But for those

who sought out *Gloomhaven* because of its overabundance of bits and systems, these adaptations will not suffice.

As *Gloomhaven* inches toward the digital end of the spectrum due to its size and complexity, other games might move the opposite direction. *Slay the Spire* (MegaCrit, 2017) is a digital card game that draws its inspiration from physical deckbuilding games like *Dominion* (Vaccarino, 2008). Both mechanically and in terms of presentation, the game could have been designed as a physical game. The basic gameplay has players draw and play cards to deal and block damage as they fight various monsters, dealing with simple arithmetic to handle the damage resolutions. The game's art is two-dimensional and its characters feature only minor animations. As the game goes on, the number of enemies and the calculations required to manage their health and status effects as well as the player's own would be unwieldy to process via human computation, though. Digital computation invites complexity. Just backed on Kickstarter this year, *Ruins: Death Binder* (Vogensinger, 2021) is mechanically very similar to Slay the Spire, a connection acknowledged in its marketing material and by its inclusion of the *Slay the Spire* cast as bonus crossover content (Heavy Punch Games, 2020). *Ruins* aims to recreate the *Slay the Spire* experience in a physical form with rules manageable for human computation.

Taking an object-focused approach to board game components allows us to expand Juul's framework as it relates to board games. Juul provides examples of combinations of types of game states and computation, contrasting the analog game states and human computation of board games with the digital memory and digital computation of video games. He does not present examples that combine analog game states

with digital computation and vice versa, but we see in board games that these combinations are present. We also see that game states and computation need not be completely analog or digital. Many hybrid games feature both analog and digital components, and parts of the rules that are handled automatically while others are socially negotiated.

Implicit in Juul's understanding of digital computation is the causal relationship between digital game states and digital computation. He maps digital game states and digital computation to the primary characteristics of computational systems: memory and processing. Computers cannot perform calculations on data that they do not have in storage, just as rules computation cannot be performed without knowing the game state. This causal relationship is made explicit in an object-focused analysis, as digital computation governs only the areas of the game state it knows.

Board games are sets of objects tied together by rules. Adapting them digitally is a three-part process: their objects are digitally mediated, their game state information is digitized, and their rules are codified into the game's programming. Board game mediation, then, is a spectrum from analog to digital based on degrees of these processes. There is pleasure in handling material game components. Companies like CMON and Fantasy Flight Games seem aware of this as they refuse to abandon materiality entirely. But the desire for more complex games leads to a pursuit of computerized rules enforcement. This drive leads to the digitization we see in dedicated digital adaptations of games and in sensor-based systems like *Teburu*. The benefits of digital elements beckon designers to push games further down the spectrum, inventing new forms of digital-analog hybridization. Hybridization challenges conceptions of presentation

and mechanics as simple binary terms, each being entirely physical or entirely digital. Understanding analog games as collections of operational logics, rules with associated components, prepares us better to examine these liminal spaces.

Applying this approach to other types of analog games provides additional insight. Escape games are a genre of games that exist across media, with digital and analog versions. Like a board game, each escape game is a multimedia experience. In a live action escape room, players use their bodies to navigate a physical space and interact with a multitude of objects in order to escape. Just as a board game's box contains its components, the four walls of an escape room separate its objects from the outside world. We can understand both board games and escape games as collections of objects. Unlike board games, though, escape games place less emphasis on digitization and codification. The rules of a live action escape room are largely implicit, determined by the affordances of the objects within. Whether a key unlocks a door is not determined by a written rule, but by the laws of physics and the shape of the tumbler lock. Players may interact with objects as they see fit, constrained only by the affordances of the objects and any safety regulations provided by the venue. It is not enough for adaptations of escape games to transfer the appearance of the objects that form the game's presentation layer, because the mechanical layer is driven by the affordances of the objects. The adaptation of escape games is one based in the mediation of objects and the capturing of their affordances. Viewing this genre through this lens expands our understanding of object mediation.

Chapter 2

Escape Game Adaptation

A team of players erupt from the opened door of a live action escape room, setting a new record for display on the lobby television. At home, a different player watches the credits of an online room escape game scroll past, the light of the computer screen illuminating their scrawled puzzle notes. Cheers and high-fives are exchanged around a dining room table cluttered with cards as a different group stops the timer on a tabletop escape game. Elsewhere, two people pull off their virtual reality headsets and smile at each other, their work in the digital room finished. These escape games exist across digital and analog boundaries and feature widely different modes of interaction. But how are these games related to one another? This essay presents a visual schema for understanding the escape game as a unified genre spanning multiple media. It also introduces the term genre adaptation to describe the genre's expansion, a form of adaptation drawing not from individual works but from a set of genre conventions.

Currently, there are four broad categories of escape games. The first category

chronologically is the point and click escape game, a primarily browser-based subgenre of digital adventure games. In these games, players use a mouse pointer to navigate a digital space, gathering and interacting with objects with the goal of escape. Another popular subgenre is the live action escape game. Commonly called "escape rooms," these games share the objective of escape but substitute the digital space of the point and click games with a physical environment. Inspired by the popularity of escape rooms, the other two subgenres coincide with rising interest in virtual reality and board games, respectively. Virtual reality (VR) escape games come in two flavors: VR games for home PC and console platforms coexist with ones designed for dedicated commercial spaces. Escape games also appear as boxed products that can be played at home called tabletop escape games. Examples in this final category illustrate the variances in how escape games present their objects and spaces and also how conventions of the genre are adapted between subgenres.

Each escape game, regardless of subgenre, is a sequence of challenges bound to a specific space. Scott Nicholson (2016a) distinguishes between three types of challenges in escape rooms that apply across the entire genre. "Puzzles" require players to discover an answer, like the numbers in a padlock combination, based on clues. In "searching" challenges, players must find objects physically hidden in the game space. Players may also encounter "tasks" they must complete. Examples might be crossing a part of the room without stepping on the floor or following instructions to use a tool that slips under a door and opens it from the other side. Unlike puzzles, tasks focus on performance rather than mystery. A single challenge may use a combination of puzzles, searching, and

tasks. These challenges can then be sequenced in various ways, such as one linear string of challenges or several concurrent paths culminating in a final challenge (Nicholson, 2016b).

The objects in the game space are central to these challenges and the linkages between them. These objects simultaneously play the roles of clues and tools. Players must use them to determine which objects should be manipulated and in what way and then perform the determined course of action. The same object may both hide clues required to solve a puzzle and have a use necessary to complete a task. In the process of designing an escape game, creators curate a set of objects and place them in the game space to create the desired structure. A puzzle requiring a certain clue is placed later in the sequence of challenges if that clue is only acquired by completing an earlier challenge. This partially explains the prevalence of locks and keys in these games; locked containers seal away clues for later puzzles and tools for later tasks, creating the overarching structure of the game. Nicholson (2016a) argues that the chosen objects also have an important role to play for immersion. Items and puzzles that do not match the setting, like a flashlight hidden in an ancient pyramid, seem out of place. There is a danger in including objects that only enhance the theming, though. A statue in the same pyramid-themed room may be a red herring that distracts players if it is not important to the room's challenges.

The resulting multitude of objects and devices contained in the room make the escape game a multimedia experience. Clues may be hidden in books or on paintings, and players might need to interact with electronic locks and other machinery. Each

form of the escape game mediates its objects in a different way, and this can be used as a means of comparison between subgenres. The objects in a live action escape room are physical and can be directly manipulated. Players can touch the objects and interact with them using their senses just as they could if the object were outside of the designated space of the game. This subgenre forms a baseline for comparison.

Looking at the way other forms of escape games mediate their objects reveals two main spectrums on which they differ. In some games, the objects appear in physical form. This includes the objects in live action rooms, but also the components of the tabletop escape games: while the objects may not be in their standard form, the cards or other pieces that represent them are tangible. The digital representations of objects displayed on computer screens and virtual reality headsets are, by comparison, intangible. The player does not directly inhabit the fictional space of the digital representations and can only interact with them through the game's interface. We can call this dimension tangibility. The second dimension describes how the object might be used. The unmediated objects in the live action escape room have affordances determined by their shape and material composition. A rubber ball can be rolled down a tube or bounced off a surface. These affordances may or may not be captured well in the new mediated form of the object. An illustration of a rubber ball on a playing card will not maintain these specific affordances, while a 3D sphere responding to physics in a virtual reality environment might. A player in a live action escape room could use a screwdriver to release the screws holding a vent cover, but a point and click game's screwdriver can only perform that action if the game's programming specifically allows

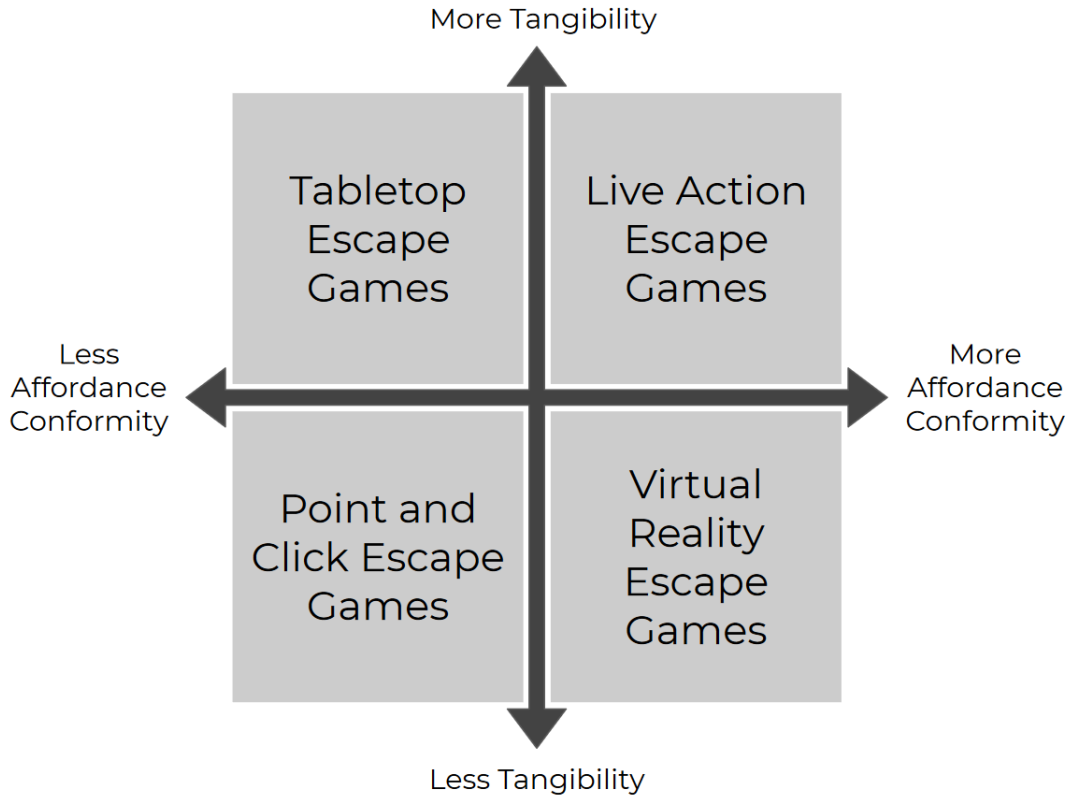

Figure 2.1: Descriptive schema of how objects are mediated in different escape room types.

that interaction. In this way, designers of other types of escape games might pick and choose the affordances necessary to solve their puzzles. The fact that the tip of the screwdriver might be used to etch words into wood is an affordance that might not be matched by its digital representation, but that affordance might not be desired in either game at all. We can call the degree of similarity between the affordances of the mediated objects and their unmediated forms affordance conformity. Using these two concepts of tangibility and affordance conformity, we can begin to lay out how different types of escape games relate to one another.

Each of this schema's four quadrants contains a large number of individual games, and not all of them lie at the same points along the axes. The schema is not intended to bound the limits of what escape games might be like, or even include all examples within each form. The goal is to describe each category in a general sense and make observations about the relationships between these categories. The live action escape room serves as a baseline for this analysis. In general, these games are composed of physical objects which by nature have high affordance conformity with themselves. In addition to the ways in which objects are mediated, subgenres of escape games also exhibit differences in how the game space is presented. The confined space of the escape game bounds the game to a specific fictional location. In the live action escape room, play occurs in a physical manifestation of the fictional space, but this is not always the case. The way that players see the space and navigate it depends on the subgenre.

1 Point and Click Escape Games

In contrast to the live action games, the world of a point and click escape game is digital, along with all of the objects in it. In terms of the schema, they are intangible. Players experience this world through computer monitors or touch screens and interact with the objects indirectly. These digital objects have low affordance conformity with their physical counterparts because their affordances must be explicitly included.

The interfaces of these games revolve around context sensitivity. The click of a cursor or a tap of the screen are the only inputs accepted by the game and all of the

actions required of the player are mapped to that input. In one of the earliest games in the genre, Toshimitsu Takagi's (2004) *Crimson Room*, opening drawers, pressing buttons on a stereo, and turning dials on a locked safe are all mapped to this one input. As Clara Fernández-Vara (2008) notes in her history of adventure game interfaces, text adventure games with parsers and some point and click games are designed around the usage of specific verbs. If *Crimson Room* used one of these interfaces, players would type or select the verb "open" in order to open the cabinet's drawers. Context sensitivity demands that objects rely on a logic of skeuomorphism. The similarities to real world objects are meant to inform players on how to interact with the digital representation. As the objects only have the affordances granted to them by the programming, this logic can sometimes lead to confusion. If a player expects to adjust the tuning knobs or volume dial on *Crimson Room*'s stereo, they may be disappointed by their lack of response when clicked. Since the stereo is only used to hide a key inside its disc drive, the lack of interactivity in this case actually assists to guide players to the affordances important for the game's puzzles.

Certain objects in these games can be added to the player's inventory and then used to interact with the environment. When obtained, these objects move to an "inventory" section of the interface, representing that the player has that object in their possession. These objects are tools used to carry out tasks in the game world. *Crimson Room*, for instance, includes an electrical cord and a cassette that must both be "used on" the stereo before it can be turned on. Selecting the item in the inventory changes the mode of interaction. Now the player is holding that item and attempting to use it

in conjunction with other parts of the game world. The uses of these tools are strictly dictated by the game's programming. You can click a key and then click a door to attempt to unlock the door but using the key to crack the window will not work if it has not been explicitly included.

Compared to live action escape rooms, there is more distance between the player and the space of point-and-click escape games. These games use graphical perspective to simulate what the player might see if they were physically in the game space. The game *Cube Escape: Paradox*, a recent game in the *Rusty Lake* (2018) escape game series, scales its two-dimensional images of objects to create distance between the player's viewpoint and the location of the object. While Crimson Room's game space is three-dimensional, the same logic applies. Players move through these spaces by clicking certain areas of the screen. In *Cube Escape: Paradox*, clicking on arrows on the edges of the interface allow players to look at different areas in the room. The player's freedom to navigate the room is restricted to possibilities determined by the creators. This can lead to frustration, as it is not always clear where players are expected to look. *Crimson Room* requires players to click near the edge of a mattress to look in the space between it and the wall. Without an indication to look there, players discover this area through trial and error.

Figure 2.2: Still from Cube Escape: Paradox showing graphical perspective, arrows for switching views, and inventory slots. Screenshot by author.

2 Virtual Reality Escape Games

Like their point and click counterparts, virtual reality escape games take place in a digital environment filled with representations of objects. The way these objects are mediated is intangible. However, the affordance conformity of these representations is higher than that of the point and click games. Virtual reality's emphasis on immersion and simulation calls for objects that behave in ways that feel realistic. VR escape games for in-home use like *VR: Vacate the Room* (hOSHI, 2016) use 3D representations supported by physics engines. Rather than adding objects to an abstracted "inventory," players can carry objects around these games using motion controllers. *VR: Vacate the Room* requires players to hold virtual paper underneath red light to illuminate a secret code, unlock safes by reaching out and pressing the keypad buttons, and unlock doors by inserting and turning keys. These affordances are important to the puzzles and would

be included in a point and click version of the same game, but in a more abstracted way. The other affordances enabled by the ability to carry objects, examine them in three dimensions, and use them in physics-based interactions are not always necessary to solve puzzles. They are sometimes even detrimental. The designers of the VR game *I Expect You to Die* (Schell Games, 2017) did not specifically include the ability to throw a screwdriver out the car window, making the puzzles impossible to complete, but the way the screwdriver is mediated affords this action.

VR games take the immersive first-person view of the point and click games a step further. Using headsets, a player's view of the physical world is replaced with that of the game's digital space. The headset's head-tracking technology allows players to look around the space by turning their head just as they would in a live action escape game. The ways in which players navigate this space depends on the specific game. *I Expect You to Die*, for home VR platforms, does not allow players to move around the game space. Instead, this game allows players to pick up objects from a distance using telekinesis. Other games use room-scale VR that tracks players' positions, including some developed for the HTC Vive platform. This enables players of games like *Belko VR* (Top Right Corner, 2017) to move around the physical space in which they are playing the game as if it were the digital environment of the game. This mapping of physical space to digital space is pushed further in some escape room businesses that feature dedicated virtual reality games. The game *Eclipse* by French companies BackLight and Virtual Adventure (2017) covers 323 square feet in physical space that maps to rooms in a virtual spacecraft.

3 Tabletop Escape Games

The tabletop escape games face an additional challenge in representing their objects. As board games, they feature primarily physical components. It is logistically difficult and likely expensive to include many life-size diegetic objects in the box. Many of these games mediate the game world's objects using other physical objects that are more portable. Two of the largest series in terms of entries, *Unlock!* and *EXIT*, primarily use playing cards to mediate other objects. The objects are mediated in a tangible way, but with this level of abstraction comes a decrease in affordance conformity. Using cards to stand in for other objects requires creators to consider how the affordances of the card match up with those of the mediated object.

Attaining affordance conformity requires careful selection of target objects and forms of mediation. The *EXIT* series primarily features journal entries, maps, and other paper objects because the affordances of paper map well to those of playing cards. Players can overlay, fold, and cut up playing cards just as they could with the actual documents that are being represented. One entry in the series, *The Forgotten Island* (Brand Brand, 2017b), takes advantage of these affordances by requiring users to cut pieces of a "map" in half and overlay them in a certain way to reveal the answer to a puzzle.

At other times, the *EXIT* series seems unconcerned with affordance conformity entirely. Rather than emulating the affordances of the objects they mean to represent, the designers lean heavily into the additional affordances granted by paper mediation.

One game in the series, *Dead Man on the Orient Express* (Brand Brand, 2017a), includes paper versions of the top of a wooden table and a large diamond. Players are meant to insert the diamond into holes in the table so that the tip of the diamond points to the numbers needed for a puzzle solution. For this puzzle to work, the diamond needs to be a very specific shape that matches the holes in the table, and it would be impractical to perform this action with a life-size table and a real diamond.

Figure 2.3: Puzzle from *EXIT: Dead Man on the Orient Express*. Photograph by author.

When the affordances of the cards do not match the objects they represent, the *Unlock!* series includes a mechanic for interacting with those objects. Cards of the red and blue suits in these games can be combined with one another. To do so, players add the card numbers together and look for a card with that value. In one of the most recent entries, *Lost in the TimeWarp!* (Demaegd, 2019), players have to dig a hole. A shovel, card 14, can be combined with a lawn, card 54. To try this, players see if there

is a card 68 in the deck (14 + 54 = 68). They can then flip that card to reveal the result of the interaction: a lawn with a hole in it.

Paper representations of in-game objects also afford new possibilities that would be more difficult to achieve in their original form. The components fit in a box easily and can be played almost anywhere, rather than having to go to a dedicated location as is the case with live action rooms. As Nathan Altice (2014) identifies, playing cards themselves have affordances due to their characteristics. Cards are planar. Without bending the card, players cannot look at both sides at the same time. Cards are also uniform in size, shape, and backing. This combination allows them to be randomized when they are facedown. In Unlock!, players often have to find a certain card in the deck, and it breaks the convention of uniformity to do so. While the cards have generally uniform art on the back, each card is marked with its card number and can therefore be identified without looking at the front. Riffling through the pre-shuffled deck to find a specific card is one way that the games emulate the "searching" challenges of escape games. By hiding the game's objects on the opposite side of cards, *Unlock!* can determine when players get the objects and clues without having to physically lock away content.

Like the point and click games, there is a distance between player and game space in these games. Altice notes that cards and their arrangements can describe metaphorical spaces. Unlock! and EXIT typically use a singular card or sheet of paper to represent each area in the game space. There are cards in *Unlock! The Nautilus' Traps* (Ladagnous, 2017) that represent the living room, library, and engine room of a

submarine. Each card has art depicting a first-person view of the room reminiscent of the point and click games, populated by numbers that indicate players can draw the card of that number. The Engine Room, for example, instructs players to find and reveal card 19, which represents a sonar machine found in that room. As players reveal new spaces, their current locations are not tracked. This is unique to the tabletop games. Even if players have progressed past the Engine Room, they can still interact with the sonar machine as if they were there. Players are presumed to be simultaneously in all locations and can always access the objects in any of the rooms. Navigation of live action escape games and virtual reality escape games are based on physical movement, limiting players to objects in their vicinity. The omnipresence of the tabletop player is an extreme version of the inventory systems in point and click games. Point and click players can carry a subset of items with them to access anywhere, while tabletop players can access any revealed object.

4 Variations Within Quadrants

Like many models, the schema's clean appearance belies the true complexity of the subject matter. The monolithic quadrants imply a homogeneity amongst the games in each category that is not universal. The tabletop escape game category has noticeable variances. The *Unlock!* series, for instance, integrates digital objects. The series requires a digital mobile application that is used in conjunction with the box's components. While many of the objects in the game world are represented as cards, the

games use the app to represent more complex objects. The app features a "machine" menu where players can enter the value of certain cards in order to interact with these objects.

Figure 2.4: A physical machine card from *Unlock! The Nautilus' Traps* compared with its digital representation on a smartphone. Photograph by author.

The digital representation grants new affordances. One "machine" in *Unlock! Expedition: Challenger* (Malone, 2019) is a hollow dinosaur skull. After the players enter its card number into the app, the screen displays an image of the skull. The affordance of this skull that is useful for the games' puzzles is its ability to be blown like a horn to make a loud noise. Players can activate the horn by blowing (or yelling) into the phone's microphone. While the way the skull is represented is not tangible, the affordances of the mobile device map to the affordances of the in-game skull. As digital

representations these objects lose some degree of tangibility, but the digital mediation allows for tighter affordance conformity.

Another series of tabletop escape games instead leans more heavily into the usage of physical objects. Both entries in the *Escape Room in a Box* series tout their usage of actual locks and keys. The first game, *The Werewolf Experiment* (Patel Rubin, 2016), includes a small blacklight flashlight used to reveal hidden messages as well as a capsule that expands into a toy when immersed in water. By choosing not to add an additional layer of mediation to many of the games' objects, this series achieves higher affordance conformity.

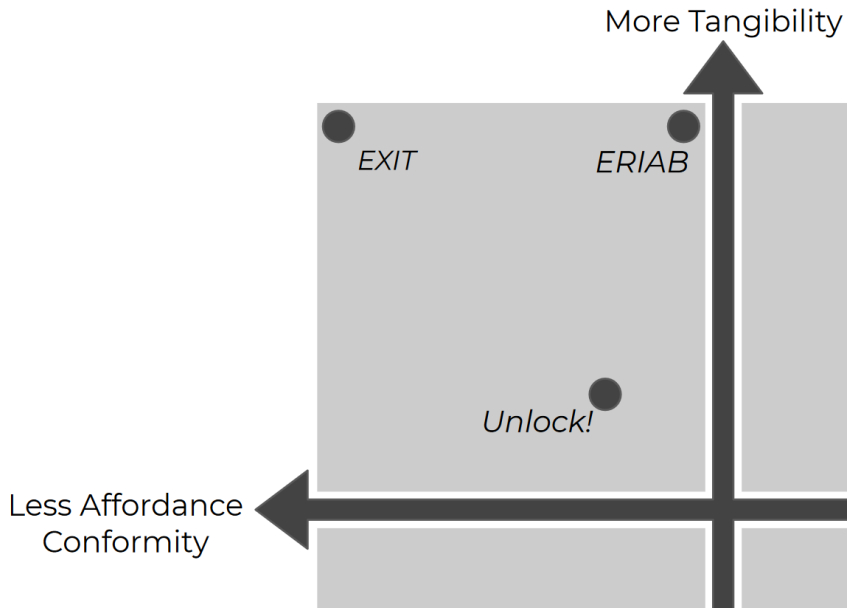

Figure 2.5: Close-up of tabletop escape games quadrant showing relative positions of *EXIT*, *Unlock!* and *Escape Room in a Box* (ERIAB).

5 Escape Games and Adaptation

The schema compares the categories in aggregate form but does not describe the nature of relationships between the categories. Uncovering these relationships is a murky task, but the concept of adaptation applies to an extent. Linda Hutcheon's (2013) book *A Theory of Adaptation* presents a framework for understanding transmedia adaptations in a broad sense. She notes that the word "adaptation" is used in both verb and noun forms, naming both a process and the product that is produced through it (p. XVI). Hutcheon discusses how stories move between three modes of engagement: showing (films, theater), telling (novels), and interacting (games) (p. XVI). This broad approach allows her framework to include adaptations from one mode to another, as is the case in book to film adaptations, as well as adaptations within a singular mode of engagement, like a film version of a theatre performance. In these terms, the movement from point and click games to live action escape rooms and the subsequent tabletop and virtual reality versions are movements within the interactive mode of engagement.

The live action escape room as a format was produced as an adaptation of the point and click escape game. Early live action escape room designers from Japan (Kato 2018), Hungary (Hooker, 2014), and the United States (Garrett-Singh, 2013) have stated that they were inspired by the digital adventure game genre. Takao Kato (2018), founder of Japanese company SCRAP Co., names *Crimson Room* specifically as a reference in an archived version of the company's About page. SCRAP Co. (2016b) introduced *Real Escape Game* to Kyoto in 2007, widely considered the first live action

escape room. The name "Real Escape Game" itself positions these games in comparison to the digital escape game. Similar comparisons are seen in the tabletop and virtual reality spaces. The back of each Unlock! box claims that its players can "experience the thrill of escape rooms without leaving the table", and the name "Escape Room in a Box" explicitly acknowledges its connection to the live action games. Websites for commercial VR escape game locations suggest that this category is rooted in the live action format. The page for Bane Escape's (2018) *The Offering* claims that it "combines a live action escape room game with an interactive virtual reality experience".

But escape games do not align perfectly to Hutcheon's model. First, Hutcheon (2013) focuses on story as the content that is being transferred across media (p. 10). While escape games feature stories to varying degrees, it is not a singular story that is being adapted from one medium to another. Second, traditional conceptions of adaptation focus on one specific work's movement across media. It is not one specific escape game being adapted into different forms. This is ultimately the problem with using the term "adaptation" to describe the relationship between these categories. Escape game adaptations draw from multiple sources, rather than one. While Hutcheon suggests that adaptations can be based on multiple sources, like how the film *Moulin Rouge* borrows songs from multiple artists and genres (p. XV), that description is not quite right here either. A tabletop escape game is not made by mashing together specific components of existing live action escape games.

Game-specific frameworks for transmedia movements are similarly insufficient for this purpose. Grabarczyk and Aarseth (2019) present an ontological framework for

understanding different versions of a single game. While their framework is primarily useful for describing ports and remakes of digital games across computational platforms, it interestingly also includes tabletop versions of video games. They use the term "resemblant" to describe the relationship of the mechanics and presentation of a video game and its board game adaptation. They argue that the actions players can take in these games and the aesthetics of these games are similar, but not identical. This is not specific enough to describe how escape games have moved across platforms, and again focuses on specific works rather than the larger genre.

As escape games develop into new areas, they borrow conventions from existing works. This adaptation is happening on the level of genre, rather than individual games. Unlock! borrows conventions from both point and click games and live action escape rooms. The Unlock! app tracks the time it takes for players to finish the challenges, giving them a lower score if they take over an hour. Time limits are a convention from live action escape games meant to keep paying customers moving through the game at a predictable rate. Time limits are largely absent from point and click escape games. Similarly, *Unlock!* games are designed for collaboration with multiple players. Live action escape rooms are touted as cooperative exercises to the extent that SCRAP Co. (2016b) in San Francisco boasts that corporations like Google, Twitter, and Apple have used their games as team-building exercises. Point and click escape games, taking place on a single screen, are generally designed for a single-player experience. At the same time, *Unlock!*'s focus on combining items and using them with one another seems particularly inspired by the inventory systems present in point and click games.

Genre adaptation is a possible term to describe the relationship between these games. There is a causal link between the different subgenres of the escape game, but these links do not happen on the level of the individual work. Genre adaptation can also be seen in board game designs. The games *BattleCon* (Talton, 2010), *Yomi* (Sirlin, 2011), and *Combo Fighter* (Johansen, 2019) are analog board games that seek to adapt the genre of digital fighting games, while *Cloudspire* (Carlson et al., 2019) draws on multiplayer online battle arena (MOBA) games. Expanding the concept of adaptation to include the genre-level will clarify analyses of similar games.

The escape game, starting from the point and click room escape game, has been adapted into radically different spaces. This paper argues for a unified understanding of the escape game genre existing across media through a process of genre adaptation. To compare between subgenres, it is useful to reframe versions of escape games as different ways to mediate objects. Escape games are a linked series of challenges in a specific space, and those challenges are formed by objects. These games differ in whether their mediated objects are tangible or not and in the degree to which they maintain the affordances of the target object. Individual games within each subgenre also vary in their approaches. Considering games in this way may also open up additional design spaces. How might digital representations better achieve affordance conformity? What other ways of mediating objects might exist? The escape game continues to morph and develop, and this screenshot of its current state may inspire future subgenres.

Understanding adaptation between analog and digital games is an increasingly complex problem, as the spaces between analog and digital populate with hybrid exam-

ples. An object-focused approach creates a spectrum between analog and digital poles that encompasses these hybrid games. Escape games highlight the process of mediation, the representation of objects in different media. The same object in different escape games appears in different forms. This same principle applies to the adaptation of analog board games into digital games. Examining the relationship between board games and digitality reveals two other processes that are part of adaptation. the transfer of game state and computation respectively, each have several forms. Mediation, digitization, and codification break the nebulous concept of adaptation into understandable subprocesses, each or which can be done partially or completely. Escape games also illuminate the concept of genre adaptation, adaptation that does not use a singular source text but instead a set of genre conventions.

While in creating the framework, we divide escape games and board games into categories, we also see the similarities between those categories. These unified views of escape games and board games place games in relationship with one another for both contrast and comparison. It is not enough to study any of these categories in isolation from the others. Escape games and board games exist in a network of adaptation, materiality, and digitality. This framework can be applied to other game genres. Just as analyzing escape games broadens the concept of mediation, deep analyses of other genres might similarly expand the concepts of digitization and codification and provide new insight for understanding emerging forms of game adaptation.

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