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# Video Game Audio Techniques Applied to Board Game Companion Applications

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December, 2019

## Introduction

Video games have been one of the most popular forms of entertainment since the turn of the 20th century. Starting in pinball machines that developed into arcade games and now lovingly into virtual reality, console, and handheld gaming systems, video games have become a normal factor in people's lives. It is no mystery why they are so popular; games not only give us a sense of accomplishment beyond what our physical and mental limits could achieve, but also evoke our imaginations by drawing us into a new world that is magical or something we would never have seen before. Think about an arcade--inside there are flashing lights, loud music; some cabinets even call out to you. Every sound is designed to entice the players. That remained the case as video games improved. To deepen the immersion for the player, the sounds need to be more realistic: there are more dialogue options; the sounds are varied and authentic; and they respond to what the player does. The storylines and relationships are deeper, and the players begin to feel honest emotions towards the characters in the story. Video games are so popular that other games have fallen out of popularity, board games included. Board games are nostalgic, and bring back fond memories for many people, but when placed against video games, the old classics barely stand a chance, specifically with younger generations. Board games typically require multiple players in the same space/location and a decent understanding of the rules. There are no flashing lights, music, or any of the immersion methods seen in successful video games. However, within the last decade, board game developers have begun releasing applications that can accompany board games. The games can still be played without the apps, but with the companions apps player can now play alone or with people. There are sounds that

introduce monsters, and some, like *Mansions of Madness*, have dialogue you can hear from the enemies. These games have become very popular, and several games released now have advertised their companion application as well. *Dead of Winter* released an app that plays sounds of a blizzard, creaking, and low suspenseful tones, as well as narration. The app is designed to replace the event cards and supply background ambiance. *Ultimate Werewolf* guides the players through the game, explaining the rules, and plays background music and sound effects. Now the question is: how can we make board games more immersive? This paper will explore the history, techniques and successful immersion techniques of video games, and then explore what can be applied to a board game companion application. There are obviously obstacles--there are no reacting sounds to a player's immediate movement, because there are many players and many actions that can be taken. There are no responsive visuals, and limited dialogue. However, more dialogue options, graphic art, and detailed background music can aid in the immersion and enjoyment of a board game, which is exactly what I set out to accomplish in making my own game.

## History/Background of Video Games

Video games started as pinball machines in arcades. Collins explains in *Game Sound* "Many of the thematic concepts of the earliest video games (such as racecar driving, hunting, baseball, and gunfights) had first been seen in the mechanical novelty game machines that lined the Victorian arcades" (7). The sound effects used in these games can be created by the physical components within the game making sounds. For example, in Pinball machine games, the sounds come from the pinball hitting obstacles and sounding bells. There were little to no sound effects or music for those games because there was not a method of storing those files yet. As arcade games progressed, developers found that adding in sounds to signify a win or a loss would encourage players to keep attempting to get further and further into the game (Collins, *Game Sound*, 8). Specifically, "sound was a key factor in generating the feeling of success, as sound effects were often used for wins or *near wins*, to create the illusion of winning. Indeed, the importance of sound in attracting players and keeping them interested was not lost on these companies when they later ventured into the video arcade games market" (Collins, *Game Sound* 8). As games got more complex and intricate, so did the sounds. Sound chips were added to hold music but could only process one sound at a time (Collins, *Game Sound*, 16). Developers then added multiple sound chips: one to play music, one for sound effects, and sometimes one for dialogue. Games such as *Pong*, *Man Eater*, and *Space Invaders* used bright lights and sounds to entice players to play the game. Game developers had to find a way to stand out in a room of games using loud music and visuals to remain relevant. Sounds were also originally advertising electronic sounds, but soon developers realized that realistic sounds were more popular (Collins,

*Game Sound* 9). The games already play into a fantasy for a player. Rather than a constant audio reminder that what they are seeing is not real, players prefer realism in the world they see unfurling in front of their eyes.

By the 1980s, sound chips were being used on top of each other; and "most game systems had co-processors specifically to deal with sound, although the majority of games had yet to develop any continuous music" (Collins, *Game Sound* 16). Techniques such as continuous looping and layering of two or three sound chips aided in the complexity, but the chips could only hold a small amount of data. While adding more chips meant more to be processed, the advantage of using multiple chips allowed multiple sounds to play at once without halting another sound. Since chips can only play one sound at a time, if a sound effect were to be triggered from a player's action, to play that sound effect through the same card would mean the music r continuous track would have to stop to allow the effect, then start again. These abrupt changes in sound can be jarring for the player, and take them out of the game headspace. Therefore, layering multiple chips to play sounds at the same time was a viable solution.

In the 1990s, soundships were upgraded into cassettes, floppy disks, and cartridges that were able to hold more sounds and music. Looping and layering techniques again helped get the most out of still limited storage. Despite the progress in technology, memory was still a problem for developers:

The data cassettes--the most popular storage medium for games--had built-in audio converters to convert the computer's digital information into analog sound, though the loading of games on cassette was slower than it was on floppy. The floppy disks, on the

other hand, offered faster loading but less storage, providing a total storage capacity of 170 kB, of which music was usually limited to between 5 and 10 kB. (Collins, *Game Sound* 31)

Storage would continue to be an issue until well into the turn of the century, which meant the sound designers and composers had to get creative. Composers would have specific limitations on their music depending on the game. In *Frogger*, each level took roughly thirty seconds to complete. The composer wrote a short music clip (with sound effects to respond to the player control) that would get faster as the game progressed. *Frogger* had roughly thirty levels. MIDI was soon introduced to game sound and was a *game changer* (pardon my pun). Composers were able to write deeper, more complex compositions to fit in their designated space because "the audio file consisted of only code, rather than recorded digital audio files (which would come later), and thereby would take up little of a game's limited amount of RAM" (Collins, *Game Sound* 50). MIDI allowed more data for processing by breaking the sounds down into code, and the technology paired with MIDI processing could process this in the limited space composers had for their sounds. MIDI processors could store only 128 sounds/voices, but there was a select amount unusable by musicians. Some of the sounds were less musical or could not be musically manipulated. Additionally, some data through MIDI processors would sound one way on a soundcard, and sound perfect to the composer, but would be completely different on another sound card. For example, sounds on console could sound very different on PCs (Collins, *Game Sound* 38). Therefore, while MIDI allowed substantial advancements for game music, there was still large room for improvement.

Coming to the end of the 1990s and into the 21st century, games had evolved from arcades to consoles and from consoles to PCs. Microprocessors had developed to process the MIDI data for sound, which meant more sounds could be used in the game. Arcade games became less popular as players turned in favor of consoles and PCs, where they could now play all of their favored arcade games in the comfort of home; "The Magnavox Odyssey, released in 1972 (in black and white, with no sound) had some success, but it was Atari, piggybacking on their arcade hit and releasing *Pong* on the Sears Tele-Games system in 1975, which really brought gaming home to the masses" (Collins, *Game Sound* 20). Gaming consoles were still relatively expensive, but kids would flock to their neighbor's or friend's houses to play the consoles instead of the arcades. Microprocessors then were mass produced, and made to be inexpensive so consoles to sell more product. Playstation, Nintendo, and Windows Xbox emerged out of the 1990s as the dominant preferred console, and has maintained control of the market since (Collins, *Game Sound* 96-102).

Computers were being designed with games and their sound demands in mind. As graphics progressed in detail, so did the sound. PCs, of course, started only being able to process very little, as Collins states in *Game Sound*: "The first IBM PCs and clones contained only a tiny speaker that could produce simple tones of varying pitch but of a fixed volume, designed to indicate errors or other messages, sometimes referred to as a *bipper* or a *beeper*" ( 29). However, the same improvements made to consoles could be made to computers as well, and soon microprocessors and other technological improvements allowed for all MIDI to be processed the same and sound the same. As for the sound processing, FM synthesis became common in computers, but there was one drawback: "most home computers had FM soundcards supporting



MIDI, but many of these soundcards were cheaply produced, and the FM synthesis made MIDI music sound disappointing in the face of CD releases" (Collins, *Game Sound* 63).

Visuals were becoming more dynamic, and the size of game space increased. Audio capability improved as well. Larger music pieces were able to be included in the games; differing soundtracks to evoke emotional responses were possible; and games had more realistic and varied sound effects. Audio was able to become more realistic, and composers moved away from MIDI in favor of MOD: "MOD files had an advantage over MIDI, then, in that music or other sound events would sound as the composer/sound designer intended, and in that more possible sounds were opened up for the authors to use. Not only this, but the ease of sampling meant that much more realistic sound effects could be used" (Collins, *Game Sound* 58). Whereas MIDI had a preset array of 128 sounds to choose from, composers could use MOD to pre-record and modify their sounds to their liking. MOD opened the door to a new world of sound possibilities, limited by the composer's imagination. At the start of the century, computers have been preferred by consumers because of the versatility and modifications the players can make on their games. However, within the last decade consoles have become more than just a gaming device, and the "success of home consoles for a time was viewed as a threat to the PC market; after all, consoles were becoming full multimedia devices, and many people who had used their PCs for little more than playing games and surfing the Internet could do these through a much cheaper console" (Collins, *Game Sound* 73). We are seeing this presently, as Playstation and Xbox are releasing their consoles to be compatible with streaming applications, which is making cable connections insignificant.

Video games as we now know them are tuned to the player's exact liking. Players have multiple choices available for how they prefer to play--from the clothes their characters wore down to their voices. *The Sims* did an excellent job of this, allowing the player to choose the type of voice they wanted for their Sim and in what vocal register. Players were able to choose the music their Sim likes to listen to, and there were zone-specific soundtracks for players to listen to as they live vicariously through their Sim. In *Dragon Age Origins*, players are able to choose how they sound to NPCs. In character creation, players can choose from Human, Elf, or Dwarf (male or female). They are then able to choose a class and features, which allows for the option of how they want to sound to others they talk to. The options are sultry, experienced, mystical, cocky, suave, smart, wise, and even violent. From the beginning, these game developers were getting their players into a role playing mind set, which aids to the immersion for the players.

Video games have been consistently raising the bar for players as technology has progressed. The success of a game, however, is not solely in the quality of graphics and sounds, but in how the game evokes emotional connections. A lot of older arcade-type games have remained in the public eye because they are nostalgic for players and represent the beginning of an era. Games released since then have been in intense competition, where the shining beacons of growth shine. Every game is reaching to push the boundaries and go beyond player expectations. The goal for any game production team is to be memorable, be popular, and, of course, continue sales of their game for as long as possible. There are several factors that go into making a game memorable for the player and what makes the player come back to it again and again. One significant factor is how immersed the player feels in the world of the game.

There are several ways to enhance a player's immersion in a game. The most successful and resounding method is to make the player emotionally connected to their character, as well as other characters/NPCs in the game. This means creating a history between the player and their character and allowing pathways for a relationship to form between the player and several NPCs. Musically, this can be achieved through the composer immersing themselves into the world they imagine and giving themselves fully to the creation of those sounds while completely in that immersed headspace. Creating the right sounds is crucial to the experience of the game, as Karen Collins discusses, saying "Game *sound*...refers to all of the sonic aspects of a game--discrete sound effects, ambient sound beds, dialog, music, and interface sounds. In games, these sonic elements are often closely integrated into the experience of play" (*Playing With Sound* 3). More detail makes the world within the game seem more realistic and believable to the player. That is why sounds have advanced away from synthetic sounds for more authentic ones, because it makes the world the player sees in front of their eyes seem real. As Chance Thomas states in *Composing Music for Games: the Art, Technology and Business of Video Game Scoring*, "Many successful video game composers find that the best way to tap into a creative state is to immerse themselves in a new project as thoroughly as possible...Immersion is most successful when composers are able to tap deeply into their own imagination. There really is no trick, technique or technology that can rival the human imagination" (137). The composer can communicate their vision to the player/audience using audiovisual effects to support the imagination of the player.

As players, we fill in visual gaps to make the rest of the image make sense in our minds. Video games use panning and location-based sounds to put us in the space of the game. For the sounds we can not connect to a visual we see on the screen, our minds naturally fill in the image.

For games that are typically dark, we rely on sounds and music cues to let us know what is ahead of us. In *Elder Scrolls V: Skyrim* the player can delve into deep caves where there is barely enough light to illuminate the tunnels. However, the enemies called the falmer, as well as their occasional companions the chaurus, can blend into the dark. The only noise that alerts the player that there are enemies nearby is the chattering/clicking the chaurus makes or the guttural throat clearing sound the falmer make. As Karen Collins mentions this concept of audiovisuals in her book, *Playing with Sound*: "[video game players] must rely on the audiovisual to navigate a game successfully. Put in simple terms, the stakes for players' involvement, interpretation, and therefore attention are higher in games, so they listen more actively and employ different modes of listening to guide their own movements and actions in the game" (*Playing with Sound* 22).

Now for characters that do have a familiar form to something we have already seen, it is easy to put an image to the sound. A sheep bleating is easy to recognize, and therefore someone can put an image to the sound. However, the player might not recognize the choking sound a falmer makes, and has never seen them before, and therefore does not know what to expect. The inability to place an image to the sounds, and with a history of violence the player has been sure to experience, the player is sure to be more cautious and listen actively for more audible clues of what is ahead. The choking sound and grumbling tells us that the enemy is more than likely humanoid, and therefore carries weapons, but the chattering is too sharp to be human, and so therefore must be a creature with claws, teeth, and/or size. All of that information can be processed by the player from the audio cue programmed into the game; "Our perception of sound is affected by how we listen to sound. Listening is not merely the act of hearing sound but also is consciously attending to sound" (Collins, *Playing with Sound* 4).

Deeper immersion can also be accomplished using multiple dialogue options that will create different responses and several people to talk to. It also helps the player to see relationships NPCs have with each other. The player feels like they stumbled into the secret life of the barkeep and his addiction to gambling, or sees the sadness in an old woman's face as she talks about her husband whom she lost long ago, or experiences the desperation of the child to hide from his mother because he broke a family heirloom. These connections are not entirely on the sound designers, but they also are established in the story development and writing.

That is not to say that the sounds do not have a major role to play. Video games have panning abilities, allowing the player to hear the spatial direction of where a noise or voice came from, which provides a sense of being in the space itself. They also include varying sound effects, which can reflect how the player comes into contact with an object. The speed and angle of the player can change the sound, which is incredibly realistic. Players hear sounds and see visuals near to what they could see in real life, but in the world of the game they could do things they never dreamed of before. Players can now see themselves storming a castle, riding a horse in the Wild West, leading comrades into a fight in the trenches in World War One, and casting spells at dragons. This all unfolds before the player's eyes, and combined with the emotional connections and detailed sound files, this deepens the immersion for the player.

An example of this is in *The Elder Scrolls V: Skyrim*. At the end of the Dragonborn questline, the player is instructed to kill Parthurnax, a dragon who betrayed his leader Alduin to help the player defeat said leader. Parthurnax has a lot of dialogue with the player, and the player gets to know him very well, as well as the hardships and difficulties Parthurnax faces due to his betrayal. When told to kill him, many players decide not to, because they can not bring

themselves to. The music score at this point is familiar to the player, and the long, lamenting strings and wind instruments can evoke a feeling of longing and sadness within the player, making this moment especially difficult to make a decision. The composer for the game, Jeremy Soule, labored to make *Skyrim* the most audibly rich game of the time; "I really want the entire gamut of the experience of the music to reflect the real world not just a virtual world" (AugustinC). Many would claim that he was successful as the game is still one of the most popular games to be played almost a decade after its release and is even being adapted for the new virtual reality gaming platforms. In the film *A Video Game Music Documentary*, producers discuss how they wanted to make the song feel as much like the heroic viewpoint of vikings as possible, and note that they can listen to the music over and over again and it never gets old (AugustinC).

## Board Games

Board games go back almost to the beginning of society. Games have been around to stimulate perceptual awareness, strategic planning, problem solving, and critical thinking. There are endless games and variations of games such as chess, checkers, Go, bao, as well as endless card games used with a standard deck. Gobet uses the following to define board games:

First, it is concerned with rules. Board games are games with a fixed set of rules that limit the number of pieces on a board, the number of positions for these pieces, and the number of possible moves. The limitations set by these rules contrast with games of skill where the number of positions may be endless. Second, there is indeed a board with pieces on it. This aspect also states that moves or placement of pieces may influence the situation on a board and that pieces relate to each other on a board. (2)

Board games are games where there are physical pieces that a player or players interact with. There are different categories of board games such as "[w]ar games [which] include chess, Go, bao, draughts, and most other games in which the destruction of the opponent is the main objective of the game" (Gobet 4). Modern versions of these games might be *Battleship*, *Magic the Gathering*, and others of the like. Race games are different in that the object of the game is not to destroy the other player, but "to reach a target for which capturing pieces of the opponent is only one means to an end" (Gobet 4). This means there is a goal, and the players are trying to

reach the finish line/goal before their opponents. Games of this category are *Settlers of Catan*, *Sorry*, *Chutes and Ladders*, *Candyland*, *Life*, and a recent release *Villainous*. In *Villainous*, the players have their own private and independent goals and can play actions to create obstacles for their opponents while still playing actions to try to be the baddest villain of them all. There are also non-competitive games, such as cooperative games, where players work together to beat the game. Examples of these are *Pandemic*, *Desert Island*, and *Dead of Winter*. There is also non-alignment games, "where captures are not made and dice rarely play a role. Examples include gomoku, tic-tac-toe, and pegity. They require players to place their pieces, and reach a configuration" (Gobet 4).

Recent development of smart phones and devices and the applications designed for use lets people can do things such as keeping their passwords, checking the weather, and digitized some beloved board games into application formatting. Board games have taken this available technology to further their games. Companion applications to board games have opened the door to group games where no one person is left out or put in a single group. Groups can now do fantasy dungeon crawls without a dungeon master, and other games have a narrator, or simply some additional background music/sounds for effect.

*One Night Ultimate Werewolf* is a group game where the players are trying to find who the werewolf is without accusing the wrong people. If you don't find the werewolf within the designated time (kept on the app), the group loses, and those who are werewolves win. The application for this game leads the players by narrating the instructions, when to take action, and keeps time for the players. While people are waiting for their action or while discussing who the



werewolves could be, there is a background sound of creaking wood, wind, and some medieval, inn-styled music.

There are dungeon-crawl-type games of several genres, such as *Imperial Assault*, *Descent: Journeys in the Dark Second Edition*, and *Mansions of Madness*. Players typically can choose from several characters with their own abilities, a unique class, and what starting abilities/armor/weapons they would like to use. The quests/missions players can choose from differ depending on the expansions players are using, and events are determined by who is being played and where the group is going. These games do not need the companion application. There can be one person who plays the "Overlord," who dictates the story, the difficulty, and which enemies/monster groups to use. The players in this case would play against each other. The companion app makes the game become a cooperative game rather than a war game. The application typically has some simple sounds that do not layer and very little music to set an ambience. *Descent* has the option for Spligg, the goblin king, to be voice acted in the beginning of the base set beginner's mission. It also has some voice acted portions if players choose the seven-part campaign. A feminine, mysterious, and faceless voice leads the players from void to void, if they can survive. Otherwise, there are very few vocal interactions between players and the enemies. Monster groups, when activated, will make a unique sound to their monster group, alerting the player on who they will be fighting before the player can read on the screen what group is activating. Other dungeon-type companion applications have similar sound maps and typically do not do more than described.

Board games have needed this extra boost from companion apps to be able to compete in the market of entertainment. Video games are designed specifically for the individual or groups

and to trigger every need or desire while playing the game. Board-games-inspired arcade games have fallen off as well as video games have progressed into territory board games and arcade games can never truly enter. Board game stores are struggling, and companion apps have kept this form of entertainment present.

While not as visually or audibly stimulating as video games, board games can be played alone. There are several games, including *Descent*, which can be played alone. The person can see and feel the figures as he moves through his adventure and will be assured it is unlike anyone else's experience. The same fact is true for groups of people as well. As the conversation and commentary in and around the game will make the moment memorable, people will connect positive connotations with the game. While not as complex or responsive as video games, board game companion app audio has made the players feel more involved, and they can use the audio to visualize the scene they are in through the storytelling element within the game.

Additionally, board games are nostalgic, and can evoke a memory of other games played in the past that are positive memories. This is a similar feeling to the sense of accomplishment players get in video games but on a more personal level.

## Game Comparison and Applied Techniques

Video and board games have a similar purpose in that they are to bring the player into a new headspace. They can effectively evoke the player's imagination. However, video games have the advantage of the endless possibilities given by technology. While many techniques used for video games can be applied to board game apps, some would convert the board game into a video game, which is not the point of this paper.

Video games have an immediate connection to the player, who has complete control over their avatar in a game. The avatar and their surroundings will react immediately to the player's actions with visual and auditory responses. The player hears each step, as well as when they perform a jump action, and when they are talking to and around NPCs, and so on. Arnold mentions the power of interactivity in games, saying an "interactive game must ensure that the player hears sounds that provide feedback based on their actions, instruct them as to their objectives, and orientate them within the world of the game" (2). This is true for video games, but too much interactivity in a board game application beats the purpose of the application in the first place.

Video game visuals are more detailed and stimulating than visuals on a board game companion application. If a board game had the level of visuals video games do, players would pay little to no attention to what is happening on the board in front of them. Fortunately, visuals are not key to successful immersion for a player; "Even without visuals, audio-based games create a mental space in the player's mind that the player can navigate through their mental

mapping of the game's environment" (Collins, *Playing with Sound* 24). Auditory cues are more precise in video games. Companion applications can not predict the exact actions of each individual player without voice commands (which could be a factor later on as technology becomes more advanced). Music and background sounds also shift as players move around the world, giving the player a consistent sense of space in the game. People playing a board game do not move around, nor do they control those little movements in the app. If they did, the board game would become insignificant as the application would do everything they need.

The difference between video games and board games is sounds change directions, volumes, and sounds are triggered immediately by an action the player did. Of course, in a board game, there is no sound trigger to something a player does automatically. However, there are dialogue triggers, and through long soundtracks, with slow moving voices and background noises, the players of said board game can fill in the gaps themselves for their own immersion. In addition, based on the genre and boundaries one makes as they construct their artistic vision, they are further limited on the types of sounds they can use for the companion application; "Audio is further constrained by genre and audience expectations, by formal aspects of space, time, and narrative, and by the dynamic nature of gameplay. These elements have all worked to influence the ways in which game audio developed, as well as how it functions and sounds today" (Collins, *Game Sound* 5). For example, in a traditional fantasy style game, instruments like the saxophone would not fit in, nor would electronic "space" sounds. Bards use flutes, drums, and string instruments but do not use pianos or trumpets. Therefore, thematically it would not fit into the world being created. A personal constraint is my own musical ability and that I can not play instruments beyond piano. As mentioned, the piano would not fit into a

fantasy-style world. Therefore, most of the sounds I create will be sounds clipped gathered from sources such as *Tabletop Audio* or *Free Sound* (which was not used in this project).

Since the companion application's music can not be too dynamic at risk of drawing the attention from the game, most sounds will be ambient and give the world life, as described by Collins in *Game Sound*:

In addition to the sound effects and foley, ambient sounds are a key part of a game's overall feel. This may include music, or ambient dialogue, or it may include outdoor environmental sounds. Creating a mood (of safety, of excitement, and so on) can be used to prepare a player for a particular situation, or trick the player into thinking an area may be safe when it is not. (92-93)

Most of the time in quest locations the players will be in constant peril and combat, and therefore the music shall maintain a subtle dissonance to evoke a feeling of unease.

A technique that can be applied to the story as the player's develop it is the dialogue options. Players can interact with the app by choosing to speak to NPCs, who will respond depending on which player character spoke. The possibilities for the dialogue are seemingly endless. Players can talk with as many NPCs as created for that purpose, but each interaction would be done on the application and not on the board. This part of the app is in the grey area of which side it leans the game to, but if done simply, and audio is made a priority, then it will still classify as support for immersion into the board game.

Most important is to manage the flow of player progress. In games such as *Skyrim*, players can choose to ignore quest lines in favor of others. *Skyrim* has literally hundreds of hours of content, and several are not connected to each other at all. Board games need to structure for the players,

so they are not lost in the world and forget where they were going and why; "With board games, the links are directed (they can be taken in only one direction). Instead of showing how variations are interconnected, each position--what trees do--graphs show how positions are interconnected, each position being respected only once" (Gobet 13). This applies to dialogue as well. If players have too many options, then they can be easily lost and lose their way, meaning they will not reach their common goal. This is manageable for the app, and with intense planning, the application can track the progress of the players, the dialogue, and hundreds of recordings can be prepared to allow different dialogue based on previous decisions.

As for video game techniques that can be applied to companion applications, they are as follows: predetermined dialogue options for each player and NPC, creature/monster specific sounds, differing zone music/ambiance sounds, and detailed ambience. Nonaudio techniques are backstories, detailed visuals, and, of course, gameplay, but those are additions that will not be discussed in this paper. The most successful games will make a lasting effect on the player(s), which will be achieved by how connected they feel to the world created and their characters/achievements; "Emotional content encoded into the music could be used to great effect to induce a mood of dread or anxiety in the player in this way, simultaneously serving to notify and deepen immersion" (Arnold 8). The trick of this, as mentioned, is to use the application and audio to influence the players, but not enough that they are drawn away from the physical game. Audio can not be too repetitive, nor have abrasive cuts and jumps as that may impede the player's journey. Collins discusses this regarding puzzle video games, saying "Avoiding too 'memorable' a theme, or any sense of real 'beat,' was important to avoiding

listener fatigue and to not distract the listener from the activity of puzzle solving" (*Game Sound* 67), but this is also true for board games.

Going into the specific sounds in a game, there are several techniques to achieve the desired result of immersion. The player can use syncretism, fusing a sound and an image which will lead to new meanings that alter or add to the original meanings (Collins, *Playing with Sound* 20). Collins gives an excellent example to further explain this: "we dislike the sound of scraping fingers on a blackboard because we sense how it feels to do this as we hear the sound. In other words, sounds on their own can evoke images and have corporeal associations with their causality" (*Playing with Sound* 23).

Sounds can also be diegetic or non-diegetic. Diegetic sounds come from a source visible in the narrative or implied by action (Thomas 18). A player may not see the creature who made a growling noise, but the player can assume based on context it is an undead creature with a wicked nature. Non-diegetic music, on the other hand, is not visible or cannot be attached to a present action (Thomas 19). Voice acting is another underrated technique in companion applications because a voice can tell a player deeper personality traits of their avatar or a NPC; "A voice is a powerful tool. It expresses your personality better than the clothes you wear, how your hair looks, or even if you're wearing a Rolex watch. And that's what audio theater is all about...the sound of your voice. Not your age or appearance, just the sound of your voice" (Mott 4). Especially with minimum visual effects, voice acting can add depth to the story being told, and allow the players to easily accept those sounds as genuine.

For music scores, the purpose of music scoring can be broken down into six categories: "setting the mood, heightening emotion, propelling the action, providing contextual clues,

enhancing the aesthetic and contributing to structural unity" (Thomas 19). The composer will start with choosing the motif and musical inspiration called a *pallette*. Using a chosen collection of "tonal colors and sonic textures," this makes the general makeup of the music and will aid the composer in direction (Thomas 132).

Most immersion relies on the player, and composers and creators can only give as much structure to support the player's fantasy as possible. Every sound, art, and piece of music will have a different interpretation by each player,:

[T]he brain also has a deep desire to supply "aural imagery," finding internal dreamlike associations and semiotic connections, that may not be the cause of the sound, but that are images supplied by the mind of the listener. When the source of a sound cannot be identified, the listener is overcome with the need to imagine causes or physical and visual explanations for that sound. (Orteza 3)

Regardless, all experience will be remembered to some degree or another, as it is a life experience because players live through the games as they play them (AugustinC). The most composers and producers can do is try to set up their game so players get the most out of it as they can.



## The Process

Board games and video games have always been a big factor in my life. Each Christmas my family would get one or two board games and spend the rest of the day learning and playing those games. As time went on and my brother and I got older, we got more complex games. Within the last few years, there have been a few games that are partially supported by an app or DVD. The first game we played with this type of formatting was *Descent: Journeys into the Dark Second Edition*. It took the experience of gameplay to a whole new level. I had played Dungeons and Dragons, and the Dungeon Master would sometimes queue a soundtrack for planned opponent or events, and some would give different voices and vocal inflections for characters met in the games. None of these compared to the companion application for *Descent*.

The app allowed the players to play together and acted as a dungeon master. Each quest had a subtle background soundtrack. If the players chose to do the introduction quest given by the goblin king Spligg, they could hear water dripping onto stone, wind whistling, doors creaking, and so on. Each time a monster group is activated, the monsters have an individual noise they make so the players know what was activated before they get the chance to read what is on the screen. The app was fairly interactive, and the visuals flowed seamlessly as the course of the game progressed. I did note some room for additions that could make the game even more interactive, such as voice acting for the main villains fought in quests. The introductory quest gave a taste of that when a letter written by Spligg, the goblin king, was voice acted, and the players are able to put a voice to the image on the screen, which added more depth to the

experience. The music was also fairly undynamic, and it didn't progress past the ambience for the zones the players were in.

Other games had their own variation of companion apps that are quite successful. *Dead of Winter*, another cooperative game, is set in a zombie apocalypse. Your group is surviving in a warehouse. You choose a main objective to finish within a set amount of rounds, as well as a miniature objective you pick up each round, and your own personal objective called a secret. This is also coupled with the factors of finding food for your colony, taking out the trash, maintaining morale, and killing zombies before zones become overrun, all without getting your characters killed. The game is quite challenging by itself, and it is successful at getting the players integrated into the game without an app or sound effects. The company released an app for *Dead of Winter* that replaces the event cards, which are cards drawn each players turn, but do not take effect unless the requirements listed on the card are met. These throw a wrench in the game plan or help depending on the objectives for the players. The app has a consistent soundtrack of winter wind whistling by with occasional zombie growls. The app also does not read all of the card, so the players can not read the outcomes before making their decision, like how the physical cards would operate.

*Mansions of Madness*, also by Fantasy Flight Games, adds more voice acting into the game play. Similar to the set up of the *Descent*, the *Mansions of Madness* companion applications allows the game to become cooperative and manages the monster groups. Players explore map tiles of said mansion, trying to find clues to solve an objective, and to find an escape route. Usually players split up to complete the objective before peril takes effect (a mechanic that gives incentive for the players to move quickly, making the game a bit harder otherwise). Players

will encounter different monster groups as they explore, or they will encounter events that they need to interact with. Like in *Descent*, there is a subtle background ambience playing that adds tension to the experience. The difference is when events and monster groups are activated, there is a bit more vocal differentiation between the groups and different events that make each more individual. For example, some events will be narrated, and some monsters will speak to you before you take actions.

For the game I created, I planned on making a game in homage to *Descent*, which started my love and admiration for this evolution of board games. I created a simple fantasy type of world and started with the character creation. One aspect of video games that makes them so popular is that players are given the ability to customize the appearance of their character, to be any race, class, or gender of their choosing. Games such as The Elder Scrolls series take this even further, allowing players to make micro-changes to their characters, such as eye/nose/jaw/mouth/eyebrow shape, size, and placement. However, I would need to create a card for the created characters, make sure the characters were balanced, and not create too many options that could become overwhelming for the players. Instead of providing a system for customizable, individualized character creation, I created four characters and gave each a detailed background story that players could read to get to know their character more and possibly get attached to. I was pulling on the story-telling attachment; similar to when we read books or watch movies, people make opinions and get attached to different characters and make opinions, and develop favored characters that they can relate to.

After making the characters, I developed the story. I used sensory imagery (taste, touch, smell, sounds, sights) as a way to let the world develop within the player's imagination through narration; "Sensory immersion as created by the graphics and audio of the game, challenge-based immersion created by the player applying their skills to overcome the game's challenges, and imaginative immersion created by the player empathising with their player character or becoming absorbed in the story of the game" (Arnold 4). While open-map video games give the player freedom to do whatever they want whenever they want it, board games do not have that luxury simply because they need to follow the game. It would be a tremendous amount of planning, organization, writing, and support to allow the game to be as open as games such as *Fallout*. Even though I could have made more options for conversations, quests, and ways to approach quests, it would have been an overwhelming amount of options for the players, and they could easily lose sight of their end goal. Instead, I created three side quests that add to the world, expand character development and understanding, and give the players clues to the main quest. The players would start in a town. They will be able to talk with NPCs, and will then be prompted with response options which will differ depending on who is chosen to speak. Taking some inspiration from the *Dead of Winter* app, the players won't know what they would say in advance; they would only choose who speaks to the NPCs, and then they can listen to their character and NPC converse. The characters would have the choice to do as many or as few side quests as they want, and they can opt to go straight to the final quest. However, they will not get as much information, gold, and experience as if they had done any of the side quests.

For the music, I wanted to create distinct audio ambiances for each zone: the town, the forest, the farms, the campsite, and the tower. Since I could not predict when the fighting would

start or end, I kept the music tense, but subtle, keeping the music arcs to a minimum. I used audio from a website called *TableTop Audio*. I layered and modified the sounds to get the effect I wanted for each zone. Each piece is roughly ten minutes long, and the beginning and end do not have any obvious start or end that can notify the players the audio is repeating, which can take the players out of their immersed state. Repetitive, catchy music would also get irritating, especially if the players discuss a lot during their game, and the sounds would quickly become old. Unfortunately, since the game is being played primarily of the board, it is impossible to create an immediate sound effect for actions accurate to the person casting or fighting. This is one of the successful audio immersion techniques in video games. When a player moves, jumps, runs into a thing, moves a thing, or does an action like drawing a sword, there is an immediate sound effect. That kind of immediate sound responses can not exist for board games, as the app can not predict that sort of action. However, when a monster group is activated, there could be another soundtrack that starts, adding the sounds of swords clashing, shouting, and other battle sounds into the original track. I was unable to do this exactly, as I was limited on space and how much I could add onto an application at once. However, I did add quiet sounds of battle here and there throughout the ambient music, starting from around minute three. It would be undetectable when the players are talking over the soundtrack, but if they are in the mindset of fighting, and there is a moment of silence, those slight sounds might be heard and perceived.

The most interactive layering I added to my companion app was, of course, the conversations. My favorite part of video games is talking with NPCs, and the more options I have the better because I like to think I am forming relationships with the characters. Again, I was faced with the issue of not making it too complicated for the players. Since there would be

more than one playable character to write dialogue for as well as NPC responses, it would be difficult for the game to track relationships with individual players as the game progresses, and coding that many conversation options and responses was also a bit excessive. I had to make sure that the game still qualified as a board game and not just a video game with external parts. Therefore, I decided that players could interact with six people: the shopkeeper, the blacksmith, the bartender, the mayor, a young adventurer, and the main villain. Each NPC was given one or two written greetings, to which each player would have one individual response. The NPCs could then have their own variation of a response, and that would be the end of the conversation. If the players returned from the quest after talking to one of the NPCs, the NPC would then only have one interaction for them, such as giving them more gold. After one interaction, the NPC would go back to their initial greeting, and no conversation option would pop up. Each part of the conversation was recorded separately and then edited to take out recording discrepancies like pops and distortions. I added other sounds to the recordings as well, such as swords being drawn, footsteps and other audio support for portions that were narrated.

Beyond the voice acting for the characters and NPCs, I wanted to add one other part to my game and the audio that I had not seen in companion applications yet: a musical cinematic. I was limited here, because I have no experience putting together all of the animations and art for a Blizzard level of cinematic, but I aimed to create a collection of images that introduced each player and how the group came together. For the song, I was inspired by “Ragnar the Red” from *Elder Scrolls V: Skyrim*, which told a narrative in a comedic sense. I wrote a simple 12-bar frame, strummed on ukulele and guitar, and added the vocals sung above it, as if you were hearing it in a tavern while drinking mead. This bard addition was split into three parts: the

beginning, so the players see how their group was formed; a smaller section to narrate their journey to the final mission; and the final song that tells the group's final tale. The players get to hear the song being sung about them, which can give them the sense that they are having an effect on the world and the people within it, and they had a lasting impact. It also gives an idea to how the game will be played, and how their avatars act. As Arnold states, "In order to avoid player frustration, the developer's expectations of the player must be clearly communicated. The audio provides valuable instruction to the player regarding the manner in which they should approach this section of gameplay" (2). Setting the mood, as well as clear and simple player instructions, will make way for a positive experience.

After planning and creating the music and audio for the game, I created the visual art, the physical board game, and rules. Each character was drawn individually, as well as background images for each location of the game to put into the app and a corresponding map tile for the players to play on. Each map tile was created as a ten-inch by ten-inch tile, to be easily stored and set up. The game as it has been created allows for room to develop and grow, and more adventures can be developed and recorded, as it is very modifiable for the players.

Going forward as technology develops, advancements on companion applications will continue to expand. Virtual reality can be applied to board games by potentially letting the characters see a projected image of their adventures going underway before their eyes. Dialogue options could layer and connect to past conversations and future ones. I can add more events and quests to the game to give it more differentiation. Companion applications for board games have only just been introduced--the road ahead will open more doors on the possibilities for audio achievements.

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