

Playing the “Fantastical Gap”: Embedded Soundscapes in Video Games

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Abstract. This article surveys the techniques of sound and music design that are used to represent games embedded within other games. Theorizing such recursive media through the literary concept of the *mise en abyme*, the article focuses on the experimental horror game *Stories Untold* (2017), arguing that sound is both an object of focus (given the game’s conceit of embedding a silent, text-based adventure game within a sounding, three-dimensional world) and the crucial factor that alerts the player to the interactions between the game’s nested narratives.

Like scholars of film music before them, those who study video game audio sometimes distinguish between sounds and music that are meant to be heard as emanating from a source within a game’s fictional world (diegetic or “source” sounds) and those that are heard to originate outside of that fiction (nondiegetic), such as musical underscoring or the sounds that accompany menu selections or other interactions.¹ Even in the film-theoretical contexts from which they have become familiar, however, the functions of these categories (and similar, related terms for the oppositions they name)² have been contested, and creative sound design has often relied on effacing the distinctions between diegetic and nondiegetic sound sources almost since the outset of sound film itself. Think, for example, of the common cinematic gesture in which a piece of source music being performed live or heard on a radio is converted into underscoring (or vice versa) with a cut or a change of perspective; or examples such as the climactic sequence of Alfred Hitchcock’s *The Man Who Knew Too Much* (1956), in which source music from an orchestra is both central to the narrative and omnipresent enough that it

serves as underscoring for several minutes.³ As Robynn Stilwell (in dialogue with Jim Buhler) writes, the distinction between diegetic and nondiegetic continues to be powerful and relevant even in spite of the frequency of such crossings—and that in fact, it is precisely because filmmakers continue to play with this boundary that there remains so much of interest to be said. Such crossings, Stilwell argues, are processes more than events—far from instantaneous, they unfold through time and imply a movement that opens a “fantastical gap” between reality and unreality. This gap, “like any liminal space, is a space of power and transformation, of inversion and the uncanny, of making strange in order to make sense.”⁴

Given the interactive nature of video games, the permeable boundary between the diegetic and nondiegetic spheres presents a particularly acute theoretical challenge. Cinematic underscoring is a paradigmatic nondiegetic soundtrack element: it comments upon the action without intervening upon it, because it is heard only by the spectator, not the characters within the narrative. But video game underscoring, even if audible only to the player, may nonetheless call that player

into action, thus affecting the course of the game: Kristine Jørgensen gives the example of foreboding music that might inspire a defensive posture or action.⁵ So while identifying sound elements like “source music” or “interface sounds” is still an effective analytical strategy, the larger theoretical distinction between sounds which are part of a game’s diegesis and those that lie outside it is even less clear in games than in cinema.⁶ Games suspend players in fantastical gaps between diegetic and nondiegetic elements as a matter of course—be they musical or visual, taking place on an interface or menu screen or within the game’s virtual proscenium arch, in the virtual world or in our living rooms.

This article contributes to the continuing theorization of ludic diegesis by exploring games that stage notionally diegetic mediascapes *within* their fictional worlds. I begin by briefly setting the stage with a term from literary theory, and exploring some of the ways in which games have been represented inside other games, both as collectible items and as more or less fully playable experiences, whether tangential to the primary game or closely integrated within it. After establishing a theoretical framework, I will explore the techniques used to represent fictional interfaces within the larger sound design of the experimental horror game *Stories Untold* (No Code, 2017), paying special attention to how the inevitable boundary crossing—from the game the human player plays, to the game being played by their avatar, and vice versa—is signified sonically.

The Mirror in the Game

I will refer to a game that contains another game within it as a *mise en abyme* game. *Mise en abyme* is a literary conceit in which a smaller version of a literary or dramatic work unfolds within that work: a “play within a play,” for instance, as in Shakespeare’s *Hamlet*. First used in a literary

context by André Gide in 1893, the term—which translates to “to put into the abyss”—comes from heraldry (the design of familial or national coats of arms), and refers to the practice of embedding a tiny image of the heraldic shield itself within the central space of the escutcheon (the “abyss”).⁷ The most influential modern study of the *mise en abyme* is Lucien Dällenbach’s *Le Récit Spéculaire* (1977, translated as *The Mirror in the Text* by Jeremy Whitely and Emma Hughes in 1989). Dällenbach shows that the embedded work almost always takes the form of a commentary or reflection on the first: “Its essential property is that it brings out the meaning and form of the work.”⁸ Sometimes this reflection is aided by narrators or other characters, for whom the embedded text is itself an object of meaning or interpretation, from which the reader may then make inferences about the primary text.⁹ Other times, the resemblance is more subtle, and readers or viewers are left to make their own connections between the primary work and the *mise en abyme*. Finally, an embedded work may be concerned, on a more metaphorical level, with emphasizing or problematizing the nature of its own medium, as is often the case in visual art, exemplified by the famous case of Diego Velazquez’s *Las Meninas* (1656; see Figure 1). The painting meditates on the nature of representation by including both the artist himself, gazing outward from behind a large canvas as if the painting’s viewer might actually be his subject, and a reflection of the King and Queen of Spain in a small mirror near the top-center of the painting, which places the royal patrons in a place of honor and again interpolates the viewer within the artistic medium.¹⁰ All of these aspects will be found in the examples studied in this article, although the most significant focus will be on the third category: the *mise en abyme* that reflects upon the medium of the game itself.



Figure 1. Diego Velasquez, *Las Meninas* (1656). Oil on canvas. 125.2 x 108.7 in. Museo del Prado, Madrid, Spain.

Games Within Games

Games nested within other games are common. Regina Seiwald distinguishes between games that have an impact on the outcome of the primary game (the “macrogame”) and those that do not.¹¹ Within the former class might fall, for example, tasks that the player carries out in order to collect resources or practice new skills. These could be explicitly framed as “minigames” to be played (imagine a simple carnival game being played within the narrative world), or they could take the form of “sidequests” that complement the main game: collect several specific objects, earn enough in-game currency to buy an item or purchase access to a new area, and so forth. Seiwald’s latter class includes games that do not contribute to or affect the main game’s outcome but exist instead as optional experiences. Many games feature small, playable games within their environments (such as the *Grand Theft Auto* series); similarly, games that are part of a long-running series may embed one or more of their

own precursor titles as a bonus feature (this happens frequently in prominent Nintendo franchises). Advances in hardware, software design, and memory capacity make it trivial to include earlier games within contemporary editions. Since those games are not actually represented *within* the gameplay of the more contemporary game, however, they do not truly constitute *mise en abyme* games. From an interpretive standpoint as well, they are not the keys to meaning that Dällenbach calls for; beyond the novelty of playing an old familiar game within a newer one, they are essentially separate experiences.

Nevertheless, there are many examples of games that are playable *within* the narrative space of another game. Nintendo’s *Animal Crossing* (Nintendo, 2001) contains a number of embedded games. The game tasks the player with collecting numerous items—furniture, decorations, clothing, and so forth—in order to furnish a virtual village. It is possible to acquire a Nintendo Entertainment System console, which can be placed in the player’s house. Through various minigames (or even promotional events external to the game) players can earn or discover games to play on the virtual system: real-world Nintendo releases such as *Donkey Kong*, *Excite-bike*, and *Punchout*. These games are played through emulation; when activated, they occupy the full screen, and they are audiovisually indistinguishable from their original versions. Within the world of *Animal Crossing*, they are being played “in” the player’s house, but other than that association, they are essentially unconnected to the rest of the game except as another class of collectible items, which a completion-minded player will want to acquire.

A more sophisticated example of emulated inclusion occurs in *Uncharted 4: A Thief’s End* (Naughty Dog, 2016). In one sequence, the main character (Nathan Drake, voiced by actor Nolan North) sits down to play an old video game at his wife’s encouragement.

The game, *Crash Bandicoot* (published by the same developer, Naughty Dog, in 1996), is shown on a television set in the character's living room. The player's perspective is imperfect, making clear the game's participation in the narrative world: while a high-resolution rendition of the game occupies most of the screen, the in-game television is slightly askew, and its boundaries are visible, placing it within the world of the more contemporary game (see Figure 2). As with the games embedded in *Animal Crossing*, the capacities of contemporary gaming systems ensure that the original *Crash Bandicoot* can be reproduced faithfully along with the visual frame, and underneath commentary by two voice actors. The framing makes it clear that *Crash* is not a bonus feature embedded in the game but rather something we are meant to experience from the protagonist's perspective. As a *mise en abyme*, the mundanity of the sequence is meant to set the stage for the game, and to advance the game's character development—the protagonist, now retired from exploration and adventure, is trying to have a quiet night at

home with his wife even as his wanderlust distracts him to the point where he can scarcely hold a conversation. In much the same way as *mise en abymes* in literature often do, the sequence offers a tiny stage for commentary on the primary narrative: the famous explorer is uncomfortable with matters both domestic and ludic, hopelessly out of place in both arenas and longing for another adventure. What's more, the characters' reactions to the game comment self-consciously on *Uncharted's* influences: Drake's skepticism toward a sequence in which Crash flees a giant rolling boulder invokes the famous opening sequence from *Raiders of the Lost Ark* (Steven Spielberg, 1982), humorously acknowledging *Uncharted's* obvious indebtedness to Steven Spielberg's series of globetrotting adventure films. ("Why is the boulder chasing me? I did nothing to this boulder.")

Not all games-within-games are simply prominent past titles by real-world developers; there are also many examples of embedded games that are original to the main game's fiction. *System Shock 2* (Looking Glass



Figure 2. Embedded games in *Uncharted 4* (2016), *System Shock 2* (1999), and *Fallout 4* (2008).

Studios, 1999) is an action role-playing game that requires players to collect supplies in order to survive. Alongside such essentials as food, medical supplies, and ammunition, players can also find a fictional handheld gaming device called a “Gamepig” and numerous porcine-themed games to play on the system. Modeled on its namesake Nintendo Game Boy (1989), the Gamepig’s titles are simple in their visual and sonic design. The games are played in a small window to the lower left-hand side of the screen, as if being held up in the player’s view. Unlike *Animal Crossing*’s complete departures from the engine, or *Crash Bandicoot* in *Uncharted 4* essentially serving as an interactive cutscene, the world of *System Shock 2* persists outside the Gamepig’s small frame; in fact, it is possible to walk around the fictional environment and even to be killed by enemies while the Gamepig is open. Similarly, several games in the *Fallout* series feature a device called a “PipBoy.” In most contexts, the wrist-mounted device acts as a diegetic interface for the game: players can manage settings and view their inventory within its frame while a hint of the environment peeks around its edges. In *Fallout 4*, just as in *System Shock 2*, players can find game tapes for the PipBoy, each of which imitates a real-world game from the 1980s. When a game is selected, an animated sequence depicts the player character’s hand inserting one of these tapes into the top of the PipBoy.¹²

The games that can be played on the Gamepig or the PipBoy are neither narratively nor mechanically necessary, and each functions primarily as an additional bit of “texture” for the game’s narrative, gesturing at the existence of a world beyond the player’s pragmatic orientation. They offer players a diversion from the main action of the game, or a marginal encouragement and reward for thoroughly exploring new areas (in both titles, these games-within-games tend to be hidden within the environment). In *System*

Shock 2, the Gamepig is more of a diversion, lending a small amount of authenticity to the idea of wandering around the game’s environment collecting junk. Not everything has a purpose or relevance for the player; in fact, some of *System Shock*’s items, much as in real life, make no contributions to advancing the narrative or strengthening the player’s capabilities; alongside its many health-restoring items, the game includes cigarettes, liquor, and junk food, the ingestion of which will actually reduce the player’s health points. The PipBoy playfully imagines how the bulky design and oversized controls of twentieth-century military equipment might fuse with nostalgic arcade titles of the 1980s. Its use of game “tapes” picks up on an actual medium from the 1980s, playfully reimagining it in portable form. Each detail reinforces the premise of *Fallout 4*: that the player-character has awakened to a world ravaged by nuclear war, in which technological advancement has been simultaneously accelerated and arrested, blending imagined technologies with mid-twentieth-century aesthetics. Because they are not strictly necessary, these devices add detail to the world, offer noncombative ways to enter the player-character’s shoes, and playfully imagine how technology might evolve in a dystopian future. *Fallout*’s PipBoy fits into a self-consciously “retro” aesthetic that is heavily dependent on midcentury Americana, offering both a sense of the setting, and a jarring juxtaposition with the post-apocalyptic state of the near-future world. In some cases, the games may even be read as commenting further on *Fallout* and its world—as Figure 2 shows, one possible game is based on *Missile Command* (Atari, 1980), a game born of the Cold War that lacks a way to win (the player can only hope to survive as long as possible before finally being overwhelmed), thereby thematizing the futility and destruction of nuclear war.

The topic of period-influenced production design and worldbuilding inevitably comes

back around to music as well, and it is worth pausing to compare these diegetically nested gaming devices with numerous diegetic radios found in games from the past two decades. The *Grand Theft Auto* franchise is perhaps the best-known example: each car driven by the player gives them access to numerous radio stations, each of which plays popular music from various genres, along with game-related audio such as fictional news updates and parody commercials. There is no other musical soundtrack, so players have complete control over what music is heard or not heard.¹³ The music available in each *Grand Theft Auto* installment represents the setting of each game; sometimes contemporary, or sometimes specific to settings like Southern California in the 1990s, or the neon-soaked Miami Beach of the 1980s.¹⁴ Numerous other action and role-playing games have also used period music to great effect. As William Cheng has discussed, an earlier title in the *Fallout* series, *Fallout 3* (Bethesda, 2008), uses three different in-game radio stations to set its scene and comment obliquely on the action; again, players are able to choose which one to listen to, if any. One station plays Sousa marches, while another features big band music from the 1940s, and a third focuses on Classical and Baroque repertoire.¹⁵ William Gibbons has highlighted a similar soundtracking strategy in *Bioshock* (2k Games, 2007), which also uses midcentury popular music to underscore not only its setting—an underwater Art Deco paradise gone wrong—but also to comment on the action with various degrees of irony.¹⁶ Both authors highlight the anempathetic juxtaposition of selections from the Great American Songbook with sequences of intense violence, although Gibbons notes that *Bioshock* does *not* give players control over the soundtrack; rather, the game’s musical cues are scripted and nondiegetic, like a conventional compilation soundtrack. Gibbons argues that this use of period music in a highly scripted

soundtrack represents a step forward in video games’ imitation of cinema.¹⁷

“There Is a House Here”: *Stories Untold*

Having explored several cases of embedded games and diegetic audio devices, the second half of this article will focus on sound design in a single *mise en abyme* game. *Stories Untold* (2017) is a retro-themed horror game developed by the independent studio No Code. Structured as four episodes (initially distinct but with connections between them gradually revealed), the game takes place in 1986, and its central conceit is that the player character plays the game almost entirely by interacting with a series of computer terminals from the period depicted.¹⁸ This vintage technology is thematized, even fetishized, throughout the game. *Stories Untold* begins with a title sequence, underscored with gentle synthesized music, which depicts various pieces of late-twentieth-century technology (a camcorder, a cathode-ray tube television, a cassette player, and more) floating through the air. In a cinematic gesture, the camera’s focus pulls across the details of their rendered surfaces, momentarily bringing faux-wood paneling, blocky industrial fonts, and oversized plastic dials into sharp relief before quickly blurring them again.

In his account of *Fallout 3*’s “big band” station, Will Cheng notes that the 1940s have become extremely familiar as a bygone era ripe for aesthetic reference, thanks to the representations of “old-timey films, television parodies, theme parties, and grandparents’ dusty records.”¹⁹ In recent media, the 1980s have been thematized in much the same way, serving as a setting with distinctive music, fashion and design cues, and technology. Many more players will remember, directly or indirectly, the period setting of *Stories Untold* than would have firsthand experience of *Bioshock* or *Fallout 3*’s settings, but the 1980s are also readily available through numerous cultural



Figure 3. The opening setting of *Stories Untold*, episode 1, “The House Abandon.”

representations, many of which idealize the period in numerous ways.²⁰ Those idealized representations—and their subversion—are central to *Stories Untold*. After the opening credits, we fade in on a desk (Figure 3), which holds a large television monitor and a bulky mechanical keyboard. A telephone hangs on the wall behind, and two family photographs are illuminated by a small desk lamp, which also casts an arc of light on the room’s brown striped wallpaper. A clock radio perched atop the monitor reads “22:05,” but the time never changes.

After the title sequence, a slow zoom in on the desk scene indicates that we have come to occupy this space. The player is incapable of moving and interacts with *Stories Untold* only through the computer monitor that occupies the left half of the screen.²¹ There is no indication of an avatar, however—no virtual hands on the keyboard—and the keys on this implied diegetic interface do not move; their heavy clicking sound is the only indication that we are meant to imagine operating this terminal. Apart from the scrolling lines of text on the small screen, sound effects become the primary signifier of interaction with the world of this otherwise static background.

Stories Untold’s opening episode, “The House Abandon,” is named after the game

depicted diegetically within: a text adventure that unfolds in much the same way as well-known examples like *Colossal Cave Adventure* (Will Crowther and Don Woods, 1977) or *Zork* (Infocom, 1980).²² This adventure game constitutes the primary point of interaction with *Stories Untold*; from a purely systemic perspective, the player merely plays a text adventure game framed by a larger scene. The audiovisual aspects of this framing scene, however, provide much of the game’s reflection on the medium of the text adventure: the relationship between the primary game space and the embedded one is arguably the game’s central conceit, and it will be the primary topic of my analysis. Beyond its pixelated title screen, *The House Abandon* has no graphics;²³ only prose descriptions that set the scene, often subtly changing to reflect the state of the game. The player interacts through a natural language parser, which accepts simple commands like “look around,” “open door,” and so forth. The fictional game boots up with a harsh whine of static, perhaps meant as the first indication that something is amiss. Once it begins, the player is immersed in a simple soundscape with only a few sound sources. There is a gentle synthesized underscore (thematically related to the introductory

music); the ambient buzz of the fluorescent light; the sound of text scrolling across the orange-hued monitor; and the clack of the large mechanical keyboard, recorded in such a way as to suggest the resonant weight and barely detectable echo of the large hardwood desk. The player begins the text adventure in their car, having just parked outside their family home. Following the directions found on a note in their glovebox, they turn on a generator in the backyard, enter the house, and explore it. When they eventually reach their childhood bedroom, the game's text describes precisely the setting of the game: there is a desk here, holding a computer matching the brand and model shown, upon which is loaded a copy of "a new horror game" entitled *The House Abandon*: the very game the player is meant to be playing on the diegetic terminal. It is clear that we have somehow found ourselves within the game.

You Are Sitting in a Room: First-Person Soundscapes

Before continuing, it will be useful to step back and theorize the sonic environment that *Stories Untold* presents. In 2008, Mark Grimshaw and Gareth Schott proposed a conceptual framework for analyzing the complex soundscapes of first-person shooter (FPS) games.²⁴ Their model, pictured in Figure 4, takes into account such elements as the simulation of the environment, sound effects that mark the actions of the player (and other players, in multiplayer modes), and the player's perception of sounds within the game. Their framework offers a useful point of departure for an analysis of *Stories Untold*, an adventure game which shares some ludic and sonic elements in common with FPS games, but also departs from them in significant ways.

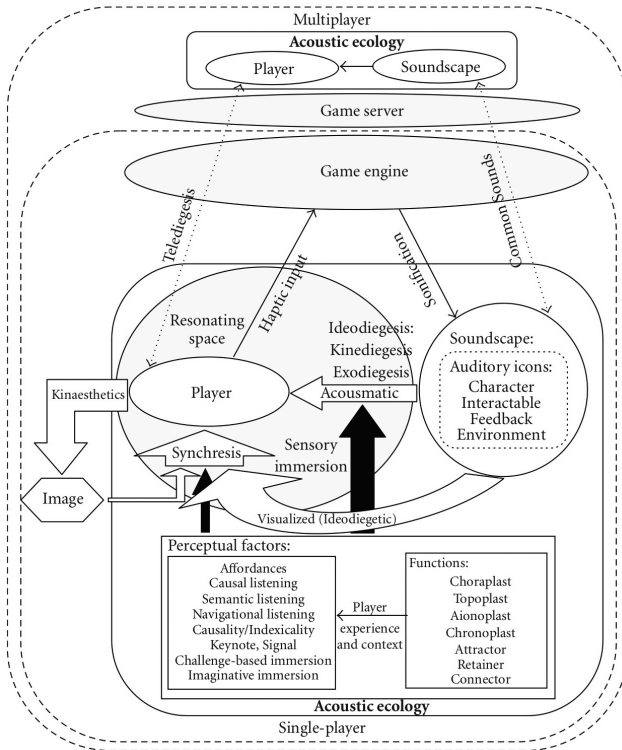


Figure 4. Grimshaw and Schott's conceptual framework of "acoustic ecology" in first-person shooter games.

Crucially, when they speak of an acoustic ecology, Grimshaw and Schott do not simply mean the sounds produced by the game, but rather the entire sonic environment in which a player exists: the sounds of the real world, in combination with the sounds produced by the game. One of the goals of first-person sound design is to create a sense of immersion (a term often cited in discussions of video game sound and music) via a detailed and realistic palette of sounds, which come together with the images on screen to syncretically give the impression of a real space.

The player's control over their own actions, the ability to move around a three-dimensional virtual environment, and the game's auditory depictions of that environment are central to the effect of immersion and authenticity produced by first-person games. Broadly speaking, Grimshaw and Schott's model describes the acoustic ecology of a game in terms of the sounds the game produces, and the way in which the player listens to them. In their diagram, the player is represented by an oblong node about two-thirds of the way down, on the left-hand side.²⁵ The primary means of interaction is depicted by a triangular area above and to the right of that node: the player's input goes only to the game engine itself, and then is reflected back in various ways, most notably for our purposes through the "sonification" arrow. Since each arrow represents the flow of some kind of information, the surfeit of arrows to the player is conspicuous. The auditory scene Grimshaw and Schott depict consists not only of numerous actions by the game (which renders the scene of play aurally through "auditory icons" that convey information about the environment and the game state) but also of an even more extensive roster of interpretive actions by the player: a series of "modes of listening" (described below), the attunement to "keynote" sounds of the environment (that is, sounds to which a listener is so attuned that they mostly ignore them, but which constitute

an essential quality of the auditory environment),²⁶ the level of immersion, and so forth.

For instance, many first-person games use stereo sound that has been processed in various ways in order to depict the movement of both the player and any nonplayer characters through space: footsteps or doors closing might be played at different volumes to indicate whether the sound source is close to the player or further away, and they can be panned to one stereo channel or the other to indicate orientation in space. What is more, in contemporary games these sounds are frequently processed in ways that reflect the acoustics of the environment being depicted: footsteps are made to echo in a canyon or a large interior space, or to sound crisp and dry in small rooms or open spaces. Grimshaw and Schott call these sounds *choroplasts* when they establish the acoustic rules of a virtual environment, and *topoplasts* when they help to position a player within a particular part of that environment. They also define *chronoplasts*, which help to mark the passage of time or evoke a particular temporal setting (such as the chirping of crickets to establish nighttime), and *aionoplasts*, which support the setting of a game within a certain era: sounds associated with the past, for instance, or futuristic sounds to indicate a science-fictional setting.²⁷

Coupled with a model of types of sounds (their subdivisions of the more recognizable division between diegetic and nondiegetic sounds), Grimshaw and Schott propose a typology of listening based on the work of Michel Chion: causal listening, reduced listening, semantic listening, and their own term, navigational listening.²⁸ Together, these listening modes constitute a useful starting point for theorizing *Stories Untold*. The game is presented from a first-person perspective, although the player is rooted in place and cannot move; in general, navigational listening does not apply. Reduced listening (attempting to study the sound's intrinsic

qualities without reference to its origin or context), Grimshaw and Schott note, is not often employed in games either. This leaves, primarily, semantic listening and causal listening. While some games demand the former of the player (through spoken dialogue, for example), the latter is *Stories Untold's* primary mode of sonic engagement. Sounds signify the player's actions, in the form of keyboard clicks and text scrolling on the screen. These are arguably aionoplasts as well; along with being essential signals of interaction, as they place the game's setting in the recent past through the hardware they depict. Many of the sounds that are encountered in the second half of the first episode suggest an approach of causal listening as well; as we will see, they tend to originate from outside the room of the game's setting, and they bear significance to the player that must be decoded.

Keeping Grimshaw and Schott's acoustic ecology in mind, along with the models for embedded games surveyed in the first part of this article, will help us to parse out the sonic situation that "The House Abandon" presents. The gameplay itself, by any definition, is concerned with the *mise en abyme* game of the same name: the player does not interact with the desktop environment. However, *The House Abandon*, as a text adventure, is itself almost silent; it produces no sound within its own fictional world, leaving only the noise of its interface (the scrolling of text across the screen). Both the sound of the keyboard and the text are diegetic within the primary narrative of the game, and the underscoring music is, as is conventional, nondiegetic. The

situation can be represented as in Figure 5, below; as we are about to see, it will form the template from which the game's "twist" departs.

The Click of the Lock Hurts to Hear: When Diegeses Converge

Faced now with yet another game within a game (within a game . . .), the player is led by the onscreen prompts to plug in the abandoned computer and load the game. Upon entering the words "play game," the diegetic terminal shorts out and the room goes dark and silent; not only has the fictional game cut out, but so too has the faint musical underscoring. After a moment, a loud thunderclap erupts, and lighting casts the frightening shadow of a bare tree across the dated wallpaper. The terminal boots up again, this time with something obviously amiss: the pixelated title card is displayed upside-down, and "GET OUT" is scrawled across the monitor several times (see Figure 6). The rest of the room's electronics remain dark. The text adventure begins in a similar manner as before, though instead of the "idyllic" and welcoming childhood home, the prose describes the house as a decrepit site of trauma; the opening description's final line, "It's good to be back," has now been replaced with "You can't stand to be here."

The player is prompted to play the game again, checking the glovebox once more for instructions and entering the house. As they restore the power within this now doubly nested game, the desk lamp comes back to life with a loud buzz, illuminating the changes that have occurred within the room:

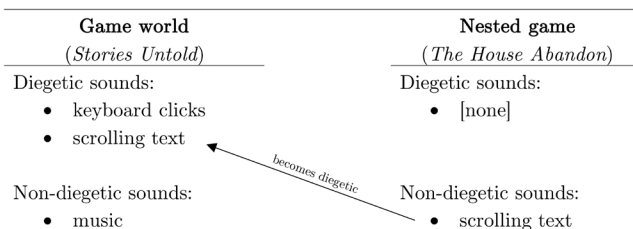


Figure 5. Diegetic and nondiegetic sound in the primary and nested game worlds.

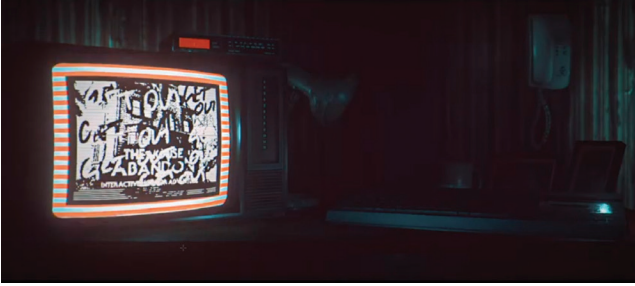


Figure 6. The “corrupted” game, running while the rest of the power is blacked out.

the wallpaper is now peeling and the eyes of the children in the pictures have been colored over with black marker. The clock radio, now in need of a reset, flashes 00:00.

Beginning from this moment, the sound design makes clear that a narrative boundary has been broken: a kind of *metalepsis* has occurred, the transgression of the boundaries assumed to separate the levels of narrative and discourse. Another concept from literary criticism, *metalepsis* distinguishes between the events of a story, and the discursive acts of speech or prose (or gameplay, in this case) that narrate those events. *Metalepses* often occur when narrators insert themselves into the story being told or somehow intercede within it; or, as in this case, they appear in connection with a *mise en abyme*, allowing the embedded narrative to subsume or intervene upon the larger narrative that had previously contained it. Literary critic Gerard Genette mentions several such cases, ranging from narrators who mention—and demonstrate—the power they wield over their characters, to a story in which a man is killed by a character in a novel that he is reading.²⁹

“You unlock the door,” the glowing text on the screen reads. “The click of the lock hurts to hear.” The player, navigating via text interface, does not hear this painful click; like all sounds and images in a text adventure game, it is left to the imagination. But with the opening and closing of the decrepit house’s door comes a symbolic breaching of the previously nostalgic environment’s

soundscape, signifying a ludic *metalepsis*. Whereas the player’s ears previously seemed to extend only to the heavy click of keyboard switches and the chirping of electronic text, new sound sources now intrude. With the inevitable next command—“open door”—a distant door creaks open and slams shut: the first signal of any kind that there is a world outside the room in which the player sits. The new soundscape thus confirms the change of state that was implied by the visual changes after the power outage caused by booting the new game.

The revelation is straight from the playbook of horror cinema (“the calls are coming from inside the house . . .”). You are not alone, the sound says. But as the text adventure continues, it becomes ever clearer that the presence downstairs is *you*: your own avatar (or more accurately your avatar’s avatar) as you play the game.³⁰ As the mirroring function of the *mise en abyme* has hinted all along, the narrative situation is not as it appears, and we are not simply playing a game within a nicely rendered frame. In fact, *Stories Untold* mirrors a well-known example from Edgar Allan Poe’s gothic short story “The Fall of the House of Usher” (1839). The tale’s narrator is staying in the foreboding manor house of his lifelong friend. This friend’s sister apparently dies from a mysterious illness, and the two men bury her in the crypt beneath the house. During one particularly dark and unsettling night, the narrator decides to pass the time by reading

a book: a fantasy tale called *Mad Trist*. As he reads passages about a knight breaking down the door to a hermit's residence and then later slaying a dragon, the narrator realizes that he is hearing the terrible sounds described in the book, coming from elsewhere in the house. "The noise of dry and hollow-sounding wood" splintering, a "low and apparently distant, but harsh, protracted, and most unusual screaming"; all of the prodigious sounds from this medieval fantasy are heard coming ever closer. As he finishes the tale, the sister appears, having broken out of her tomb and come upstairs to exact her revenge.³¹ The climactic sequence of "Fall of the House of Usher" is represented even in the silent film adaptation (Jean Epstein, 1928): with no sound to make events clear, intertitles provide the book's narration, while reaction shots and cuts to other parts of the house tearing themselves apart are meant to convey the terrifying sounds the narrator hears, though much inference is left to the

viewer (see Figure 7). Notably, the title cards themselves are radically pared down from the fictional excerpts in Poe's story; with the scenes and context removed, descriptions of the sounds are all that remain.

There is thus a notable resemblance, in terms of media, between the intertitles of the silent cinema and the scrolling descriptions of the text adventure. Just as in silent film, the diegetic world of a text adventure can be assumed to be full of sound: characters speak, houses creak, deadbolts slide noisily open. In silent film those sounds are either imaginatively provided by the viewer (we know what a police whistle, a dog barking, or a car crash should sound like), or are indicated by their effects—auditors onscreen who raise an eyebrow, crane their necks, or like Gene Kelly's silent film star in *Singin' in the Rain* (1952), exaggeratedly raise a hand to their ear. In text adventures, we read descriptions, just as we do in fiction. We might thus imagine silent media being sequestered from

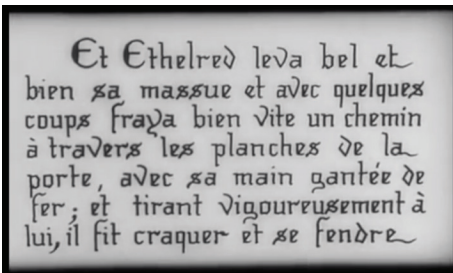


Figure 7(a). *The Fall of the House of Usher* (1928): Intertitle from "Mad Trist" (55:56) and 7(b) reaction shot of the protagonist hearing the sounds he has just read about (56:17). The French text reads: "And Ethelred raised his club, and with a few blows made his way quickly through the planks of the door with his iron-gloved hand; and pulling vigorously at it, the door cracked and split open." Compare to Poe, "The Fall of the House of Usher," 311.

sounding media by their own kind of fantastical gap: silences containing noisy fictions within their frame, being framed in turn by higher-fidelity media that stands in for reality itself. Just as Stilwell writes of diegetic boundaries, these frames become interesting when they reflect not only different states, but the fantastical act of transition itself: it isn't always transgression (to turn her phrase around), but it can be.³²

The sounds coming from below in *Stories Untold* signify nothing good, if the intertextual resonance with *The Fall of the House of Usher* is indeed to be heard. As Kristie Schlauff has written about the use of supernatural hearing in another story, "The Telltale Heart," Poe was fascinated with the emergence of the stethoscope and the auricular regime it ushered into medicine in the opening decades of the nineteenth century, and many of his stories displayed this fixation in the form of characters whose overactive senses were often described as a kind of curse or affliction.³³ "Poe's awareness of how stethoscopic listening reshaped scientific and societal modes of observation," writes Schlauff, "is coupled with his sense that disrupting the sensory hierarchy privileging vision might have dangerous consequences"³⁴ So too in *Stories Untold*: virtually all sounds beyond the nostalgic sonorous envelope of the vintage workstation's loudly clicking keys and quietly scrolling text are signs that the narrative order is being disrupted or threatened. Through a combination of text and sound, it achieves the gap-crossing

effect that the *Fall of the House of Usher* adaptation implies.

As the game's intensity builds, *Stories Untold* begins to use sound not only to signify what happens beyond the room, but also to show that the divisions between the levels of the narrative are in danger of collapse. The clock radio suddenly blares: a jump scare, surely supernatural (or at least superdiegetic), as the clock had been flashing zeroes in its reset state. Here, the jarring sound breaks *into* the text adventure for the first time, rather than echoing it: while the scrolling text of *The House Abandon* ordinarily runs down the screen and waits for player input (a common feature of text adventures, which can often be left at their prompts for long periods of deliberation), the blare of the clock radio interrupts the unfolding description of the decrepit house's interior. The screen is wiped, mid-paragraph, and a new line quickly begins: "Upstairs, the sound of an alarm clock blaring. Someone else is in this house. That can't be."

The collision of the nested game world and the primary game world reconfigures the sound design schematic pictured above.³⁵ As shown in Figure 8, there are now additional correspondences between the two representations. Figure 8's right-hand column (the nested game) now notionally contains several sounds, though each is in italics because it is not actually heard within the silent text adventure game; rather, two significant sounds are described (the click of the front

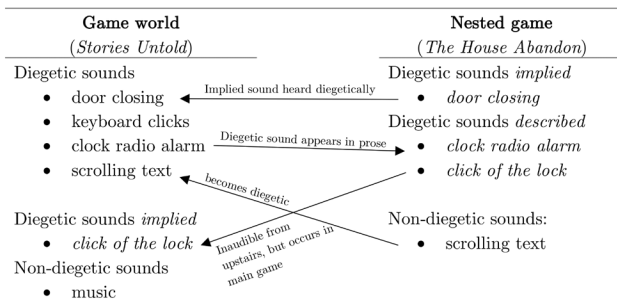


Figure 8. Reconfigured soundscape after reboot.



Figure 9. *Stories Untold*: The room as the door is opened

door's lock, and the clock radio going off upstairs), while a third is not described explicitly, but is implied because of its audibility within the primary game. Furthermore, we see a new left-to-right arrow: the sudden clock radio alarm, heard prominently in the primary game environment, makes its way into the prose description of the nested game. The connection between the two game spaces, then, goes both ways, although only one involves sounds that are actually audible to the player.

The player will eventually find their way up to the bedroom, where the text parser becomes very literal: “enter bedroom” will accomplish nothing; you must type “open door.” It creaks open and casts a rectangle of lurid red light across the scene (Figure 9). As “you” get even closer to the putative player, however, audiovisual fidelity fades. Your avatar casts no shadow in the room. Saying “hello” to the unfortunate figure playing the game, *within the game*, makes no sound. Heavy breathing is heard, though its source is indeterminate. Since the player has heard no such sound coming from their own virtual body up to this point, it must be coming from the intruder.

It is here that reflection on Grimshaw and Schott's model helps us to understand how this situation is crafted. The encounter carries the implicit threat of violence: “someone else is in the house. That can't be,” the game tells you before you direct your textual character upstairs toward your own avatar. And when the avatars meet: “YOU SHOULDN'T BE HERE. I SHOULDN'T BE HERE.” In

the conceptual framework proposed by Grimshaw and Schott, the sound design of a first-person game is meant to be immersive, but also meant to provide the player with actionable feedback. The sounds of enemies and other players are meant to be met head on, and so much of the model—and the genre—depends on your movement and agency as a player. But where does that model leave us when the player's geographic agency is taken away? First-person shooters ask us to respond to the sounds we hear by running headlong into them (or stalking carefully around them),³⁶ but the unseen player character of *Stories Untold* is rooted in place, powerless to act or escape. Seemingly frozen with fear, by design, the instincts of both video game players and horror aficionados may be waiting breathlessly for the Sword of Damocles to fall in the form of one final, fatal jump scare that would violate not only the sonic integrity of the player but the visual integrity of the scene as well. But the blow never comes. Utilizing the text adventure's key means of interaction—the need to provide the proper input in order to proceed—the game instead coerces the player into typing: “it was all my fault.” It is no longer clear, given the situation's ambiguity, who the terminal's prose is addressing (the player-character, sitting at the keyboard, or the phantasm standing behind them?) nor who is admitting fault (one of these avatars or the *player* themselves?). As the words are uttered in type, and then repeated, the breathing intensifies, panning sharply to the left as if to suggest that the figure has come even closer.

Then it stops. Perhaps, after all of this, there are no distinctions between these diegetically nested characters. After a moment, a final heavy analog click. Blackness. The credits roll.

“A Place at Once Privileged and Inescapable”: Technology as Theme and Mediator

The focus on outdated technology in *Stories Untold* is no accident; not only does it serve as an evocative shorthand that places the game clearly within the not-too-distant past (though in the timeframe of recent technological development, not too recent either), but it places itself intentionally *between* the player and their interactions with the game. The desired effect of *Stories Untold*—the immersive interpolation of the player within the setting, via the effacement of the distinction between our reality and the top level of the game's nested narratives—hinges upon the audiovisual mediations that outdated gadgets provide: the flickering CRT monitor, the chirping of the cursor, the resonant “clunk!” of the mechanical keyboard. The simulated resistance, represented audiovisually, is essential. As Emily Dolan argues, our contemporary interfaces—all glass touchscreens and nearly silent “butterfly” keyboards—have a tendency to disappear. “The touchscreens of tablets and smart phones flatten and smooth our experiences,” writes Dolan, arguing for the rediscovery of texture and tactility.³⁷ *Stories Untold* adopts the strategy of making its interface *noisy*, in both a literal and a figurative sense. It offers up audible traces of our every keystroke, and blurry scanlines like those that the player-character would have looked through thirty-five years ago. The sonic and visual aspects of vintage interfaces, in other words, are meant in this context to make the interfaces obvious, standing intentionally between the player and the game. This remediation of experience through a virtual interface is meant to engage and immerse the player, making

visible and audible the metaleptic disjunction that plays such a pivotal role in *Stories Untold*. Like the royal couple in *Las Meninas*, we are figuratively reflected in the amber-toned cathode-ray tube, or somehow “seen” by a figure within the work itself.³⁸ As Jorge Luis Borges wrote of metalepsis, “such inversions suggest that if the characters in a story can be readers or spectators, then we, their readers or spectators, can be fictitious.”³⁹ We need not believe Borges's typically vertiginous suggestion for it to underlie the vicarious threat upon which horror media relies. “The calls are coming from inside the house,” the game's layered fictions suggest, just firmly enough that we might believe it for a moment. “Your house.” The eeriness of this interpolative metalepsis is only intensified by the trope that communicative media are often conceptualized as mystical, if not literally haunted—whether they be new and disruptive to reality (think of the telegraph as a way to commune with spirits, or wax cylinders offering to preserve the voices of loved ones after their deaths) or old and dusty, packed with nostalgia—or perhaps something worse (think of the haunted videotape of *Ringu*, home to a vengeful ghost that kills those who view it).⁴⁰

Broadening out from this example and even this genre, this perspective helps us to understand more fully the devices for playing simple *mise en abyme* games within *System Shock 2* and *Fallout 3*. Their admixture of diminutive technological packages and self-consciously “retro” styling is no accident. They offer an aesthetic toehold, in the form of sounds or images that are often held up as familiar, or even nostalgic and comforting. As Sheila Kohring argues, physical miniatures inspire their own forms of bodily engagement: we hunch down or lean over them; we engage with our fingers rather than our whole arms, interacting with them on a smaller and more intimate scale than we would their full-sized counterparts (perhaps even mimicking, in this case, our physical

engagement with a computer in the real world . . .).⁴¹ The PipBoy's reduced screen, the chunky but lovingly rendered monitor taking up only a quarter of *Stories Untold*'s visible environment; these screens within screens inspire a sense of wonder—both aesthetic and embodied, Kohrig would say—in our appreciation for either clever abstraction or painstaking detail, or perhaps the sense of detailed completeness that extends, by association, to the entire virtual world that contains them (“wow, they even included a brand name,” or “they even gave the plastic a bumpy texture . . .”).

Just as embedded games can serve as “mirrors in the text,” commenting reflexively on their own media, so too can diegetic soundtracks wring significance from the technological entertainments of the past. *Fallout*'s radio stations thematize “origin stories” for their respective media. Sousa marches arrived at the advent of sound recording, which led their author to pen a famous polemic decrying “the menace of mechanical music.”⁴² The big band station depicts a golden age of radio, before television took hold. *Stories Untold* is centered on a rich, complex genre of adventure game that would quickly be superseded by graphical adventure games. In its presentation of a text adventure—one of several, or at least several variations, throughout the full four-part game—*Stories Untold* thematizes the ludic sensorium and the notion of three-dimensional space itself. Your unseen avatar is in a rendered room, which is implied to be on the second floor of a suburban house, though the rest of the structure is never seen or explored. All spatial navigation is collapsed into the text adventure's prompts, however; these spaces exist, conceptually, as hyperlinked pages of text rather than fully realized spaces. As such, they tend to be silent as well. But the screens of prose presented by *The House Abandon* brim with vivid descriptions of the sensory experiences

the player is meant to imagine within those spaces: sights, sounds, and even *smells* rule—senses deliberately withheld from the player by the text adventure format, or beyond the feasible capabilities of mediation. As the narration describes when the player “re-enters” the house after loading the game within the first game, for instance: “Pitch black, but your senses are punished more by the smell. Stale air and damp. This could not be less inviting. The note burns in your hands, you feel compelled to read it over and over.”

Images and sounds are both used to mark various changes within the game state, but it is sound that takes a primary role, given the player's static orientation to a single perspective. Without risking the kind of reductionism critiqued by Jonathan Sterne in his oft-cited “audiovisual litany,” sound is the key element being used to connect the game's narrative levels, and to drive the suggestion that they may be transgressed further.⁴³ In fact, the affordances of sound design in a stationary horror game like *Stories Untold* cut alternately with and against the grain of Sterne's litany. In a game in which the protagonist cannot move, sound is used to convey changes in state, to audibly signal that the player has entered a new area within the (purely textual, embedded) narrative. It “immerses us in the world,” as Sterne skeptically notes (unlike vision, which conventionally distances us). But while Sterne critiques common sensory ideologies that reductively metaphorize hearing as temporal rather than spatial, *Stories Untold* inverts this stereotype: in a game with few visual cues, sound is used to give spatial form to a virtual environment that otherwise exists mostly in text. And the notion that “sounds come to us,” in a horror game, is neither an expression of power nor intimacy, but rather of powerlessness and anxiety; we want to be immersed only in the sense that we may choose to play a scary game, or watch a frightening film, in order to experience these emotions vicariously in a controlled setting. While

Sterne rightly critiques the ideological role often played by casting vision—a sense “alternately denigrate[d] and elevate[d]” in common binary understandings of the senses—as the sense by which we exert reason and power over the world, in opposition to hearing’s passive sensuality, *Stories Untold* relies in many ways upon the idea that sound indexes what goes on around us, what encroaches upon us, and what takes on a larger-than-life subjective impression as it stands behind us breathing down our necks.

Final Thoughts

A common, shallow narrative of technological determinism might be applied to the parallel developments of game genres and platform technologies: that as computing power has exponentially increased over the course of several decades, so too has fidelity to reality, leaving behind genres like two-dimensional “platform” games and text adventures. This narrative, of course, is not true;⁴⁴ games have not developed on a linear, teleological path in lockstep with technology, and both the mechanical and audiovisual domains of gaming have arguably never been as varied as they are today. But rarely do we see and hear the history of games presented in such a vivid and relational manner as when developers embed another game of a different genre or redolent of an earlier era, within a contemporary title. The *mise en abyme*, as a framing device, allows game designers to mix their modes of play: using contemporary technology to frame a 1980s-style text adventure, for instance. They allow for new explorations that mix genre and play style and period, and which employ one genre to comment upon or contextualize another. Certainly, many of these embedded games are sidebars to the main experience, just as many *mise en abymes* in literature or film are tangential rather than central to the work that contains them. But along with adding texture or authenticity to the world of a

video game, embedded games (or other forms of diegetic media) take on meaning and offer their commentary by contrast, and create striking effects when they combine. Rarely are such combinations so vivid as when the sound design has to account for these mixtures, make them apparent to players, and (seemingly inevitably) help to accentuate the moment when the interactions between embedded game narratives are crossed, and things go deliciously—or terrifyingly—wrong.

NOTES

1. K. C. Collins, *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008): 125–37.
2. Michel Chion uses “pit music” and “screen music,” and names “commentative/actual” and “objective/subjective” as other sets of terms; see *Audio-Vision: Sound on Screen*, ed. and trans. Claudia Gorbman (New York: Columbia University Press, 1994): 80.
3. Royal S. Brown analyzes this sequence in *Overtones and Undertones: Reading Film Music* (Berkeley: University of California Press, 1994), 75–80.
4. Robynn J. Stilwell, “The Fantastical Gap Between Diegetic and Nondiegetic,” in *Beyond the Soundtrack: Representing Music in Cinema*, ed. Daniel Goldmark, Lawrence Kramer, and Richard Leppert (Berkeley: University of California Press, 2007), 186–87. While Stilwell argues that the distinction between diegetic and nondiegetic abides both despite and because of its frequent transgression, one of the most cogent critiques of the concept itself comes from Anahid Kassabian, who argues that the distinction rests upon the erroneous idea that film narrative exists prior to and apart from its accompanying music; musical underscore, she counters, is actually *integral* to cinematic narration. See *Hearing Film: Tracking Identifications in Contemporary Hollywood Film Music* (London: Routledge, 2011), 42. For a further complication of the distinction, see Nick Davis, “Inside/Outside the Klein Bottle,” *Music, Sound, and the Moving Image* 6, no. 1 (2012): 9–19.
5. Kristine Jørgensen, “Time for New Terminology? Diegetic and Non-Diegetic Sounds in Computer Games Revisited,” in *Game Sound*

Technology and Player Interaction: Concepts and Developments, ed. Mark Grimshaw (Hershey, PA: Information Science Reference, 2011), 78–79.

6. Axel Stockburger gives a taxonomy of video game soundscapes in “The Game Environment from an Auditive Perspective,” a paper delivered at the 2003 meeting of the Digital Games Research Association, and available online at <https://www.audiogames.net/pics/upload/gameenvironment.htm>. Stockburger’s work is usefully synthesized by Karen Cook in “Music, History, and Progress in Sid Meier’s *Civilization IV*,” in *Music in Video Games: Studying Play*, ed. K. J. Donnelly, William Gibbons, and Neil Lerner (London: Routledge, 2014), 166–82.

7. Lucien Dällenbach, *The Mirror in the Text*, trans. Jeremy Whiteley with Emma Hughes (Chicago: University of Chicago Press, 1989), 7–8.

8. Dällenbach, *Mirror in the Text*, 8.

9. Dällenbach, *Mirror in the Text*, 41–54.

10. Michel Foucault, *The Order of Things*, trans. Alan Sheridan (New York: Vintage Books, 1994), 3–16. On representations of viewership in visual art more broadly, see Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: MIT Press, 1999).

11. Regina Seiwald, “Games within Games: The Two (or More) Fictional Levels of Video Games,” *International Conference on Video Game Sciences and Arts*, ed. Nelson Zagalo et al. (New York: Springer, 2019), 18–31.

12. In using cassette tapes for the PipBoy games, *Fallout 4* makes another reference to computer technology of the 1980s, during which time tapes were sometimes used as a long-term storage solution, or to hold large programs which would be read into the computer’s RAM by “playing” the complete tape in a specialized drive. In making this technology portable (and instantaneous), *Fallout 4* joins the game *Quadrilateral Cowboy* (Blendo Games, 2016) in imagining portable analog versions of recording technologies; the latter game begins with the player-character inserting a 33 rpm record single of Claude Debussy’s *Clair de lune* into a fanciful “VinylMan” player.

13. See Kiri Miller, *Playing Along: Digital Games, YouTube, and Virtual Performance* (New York: Oxford University Press, 2012), 54–82.

14. Miller, *Playing Along*, 55–56.

15. See William Cheng, *Sound Play: Video*

Games and the Musical Imagination (New York: Oxford University Press, 2014), 28–34.

16. See William Gibbons, “Wrap Your Troubles in Dreams: Popular Music, Narrative, and Dystopia in *Bioshock*,” *Game Studies* 10, no. 3 (2010), <http://www.gamestudies.org/1003/articles/gibbons>.

17. See Gibbons, “Wrap Your Troubles in Dreams.”

18. The first episode (which is being analyzed here) began as a standalone game made for the 2016 *Ludum Dare* competition, a forty-eight-hour “game jam” in which solo developers or small teams race to complete a game in a single weekend. It was then expanded into the full four-chapter game a year later.

19. Cheng, *Sound Play*, 35.

20. See, for example, the Netflix series *Stranger Things*, which premiered in 2016 and serves as a clear intertext for *Stories Untold*; and Ernest Cline’s novel *Ready Player One* (2011, along with its 2018 film adaptation, directed by Steven Spielberg), which positions the pop-cultural texts of the 1980s as a kind of secular scripture to be studied and memorized, with rewards awaiting those most adept at their interpretation.

21. Subsequent episodes build on this mode of interaction, slowly adding to it. The second and third chapters find the player able to switch between two different banks of screens or other equipment, while the third and fourth chapters also include segments of first-person movement.

22. For more on text adventures as pieces of interactive fiction, see Nick Monfort, *Twisty Little Passages: An Approach to Interactive Fiction* (Cambridge, MA: MIT Press, 2003).

23. Throughout this article, I will refer to the fictional game in italics, and the name of the first *Stories Untold* episode in quotation marks.

24. See Mark Grimshaw and Gareth Schott, “A Conceptual Framework for the Analysis of First-Person Shooter Audio and its Potential Use for Game Engines,” *International Journal of Computer Games Technology* 2008 (2008): 1–7.

25. In this description, I will not consider the outermost “multiplayer” layer, since *Stories Untold* is a single-player game.

26. On keynote sounds, see R. Murraray Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World* (Rochester, VT: Destiny Books, 1977), 9–10.

27. See Grimshaw and Schott, "Conceptual Framework," 5; and Oskar Hansson, "Can an Optimized MidSide Technique Improve Perceived Envelopment in Game Audio" (bachelor's thesis, Luleå University of Technology, 2018), 10.

28. Grimshaw and Schott, "Conceptual Framework," 4. For Chion's modes of listening, see *Audio-Vision*, 25–34. In brief, causal listening entails listening for the source or cause of a sound (or to gather information about that cause); semantic listening is concerned with meaning, as when hearing language; and reduced listening (which Chion borrows from Pierre Schaeffer) describes the act of listening for the qualities of the sound itself, independent of its source or its semantic meaning.

29. For these and other examples, see Gerard Genette, *Narrative Discourse: An Essay in Method*, trans. Jane E. Lewin (Ithaca, NY: Cornell University Press, 1980), 234–43.

30. This sonic disjunction is a departure from the close audiovisual identification that games usually promote; see Michelle Grosser, "Avatar/Player Subjectivity: An Agential Analysis of *Crypt of the NecroDancer*," *Journal of Sound and Music in Games* 1, no. 3 (2020): 1–14.

31. Edgar Allan Poe, "The Fall of the House of Usher" (1839), in *The Complete Works of Edgar Allan Poe* (New York: G. P. Putnam's Sons, 1902).

32. Stilwell, "Fantastical Gap," 185.

33. Kristie Schlauraff, "Do You Hear What I Hear? Stethoscopic Listening in Poe's 'The Tell-Tale Heart,'" *Poe Studies* 50 (2017): 26–28. For more on the role of the stethoscope in the emergence of modern audile technique, see Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Durham, NC: Duke University Press, 2003), 99–136.

34. Schlauraff, "Do You Hear What I Hear," 34.

35. Notably, in this reconfiguration, the musical underscore remains strictly nondiegetic: there is no indication that the player-character is aware of the synthesized soundtrack, only the sound effects.

36. Kristine Jørgensen discusses sound in a related genre, that of the stealth game, in which the player's actions are highly constrained due to the need to avoid making *simulated* sounds that will convey the player's actions to the game engine, and thus to hostile nonplayer characters. Sound

design is important for the player, then, in order to monitor their own activities if they wish to avoid alerting computerized enemies who cannot themselves hear but are nonetheless informed by the game's modeling of an area's acoustic ecology. See Jørgensen, "Left in the Dark: Playing Computer Games with the Sound Turned Off," in *From Pac-Man to Pop Music: Interactive Audio in Games and New Media*, ed. K. C. Collins (Farnham, UK: Ashgate, 2008), 163–76.

37. Emily Dolan, "Toward a Musicology of Interfaces," *Keyboard Perspectives* 5 (2012): 12.

38. "As soon as they place the spectator in the field of their gaze," writes Foucault, "the painter's eyes seize hold of him, force him to enter the picture, assign him a place at once privileged and inescapable, levy their luminous and visible tribute from him, and project it upon the inaccessible surface of the canvas within the picture." See *Order of Things*, 5.

39. Borges, *Other Inquisitions, 1937–1952*, trans. Ruth Simms. Quoted in Genette, *Narrative Discourse*, 236.

40. I am grateful to one of the anonymous reviewers for pointing this connection out to me. For more on this trope, see Jeffrey Sconce, *Haunted Media: Electronic Presence from Telegraphy to Television* (Durham, NC: Duke University Press, 2000).

41. Sheila Kohring, "Bodily Skill and the Aesthetics of Miniaturization," *Pallas* 86 (2011): 33–35.

42. See John Philip Sousa, "The Menace of Mechanical Music," *Appleton's Magazine* 8 (1906): 278–284.

43. Jonathan Sterne criticizes the often unexamined tendency to conceptualize sound as the intimate, interior, emotional supplement to vision's power, rationality, and exteriority. He recites the common tenets of the "theology of listening," in order to upturn them: "Hearing places us inside an event, vision gives us perspective," for example. "Hearing tends towards subjectivity, vision tends towards objectivity. . . . Hearing is a sense that immerses us in the world, vision is a sense that removes us from it." See *Audible Past*, 14–22.

44. See Dominic Arsenault, "Video Game Genre, Evolution, and Innovation," *Eludamos: Journal for Computer Game Culture* 3, no. 2 (2009): 149–76.